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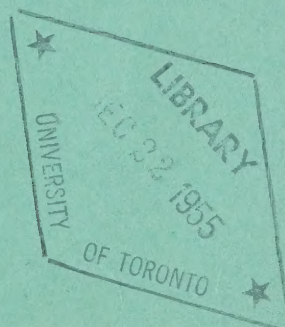


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BOTANICAL SURVEY  
OF THE  
ST. LAWRENCE SEAWAY AREA  
IN ONTARIO



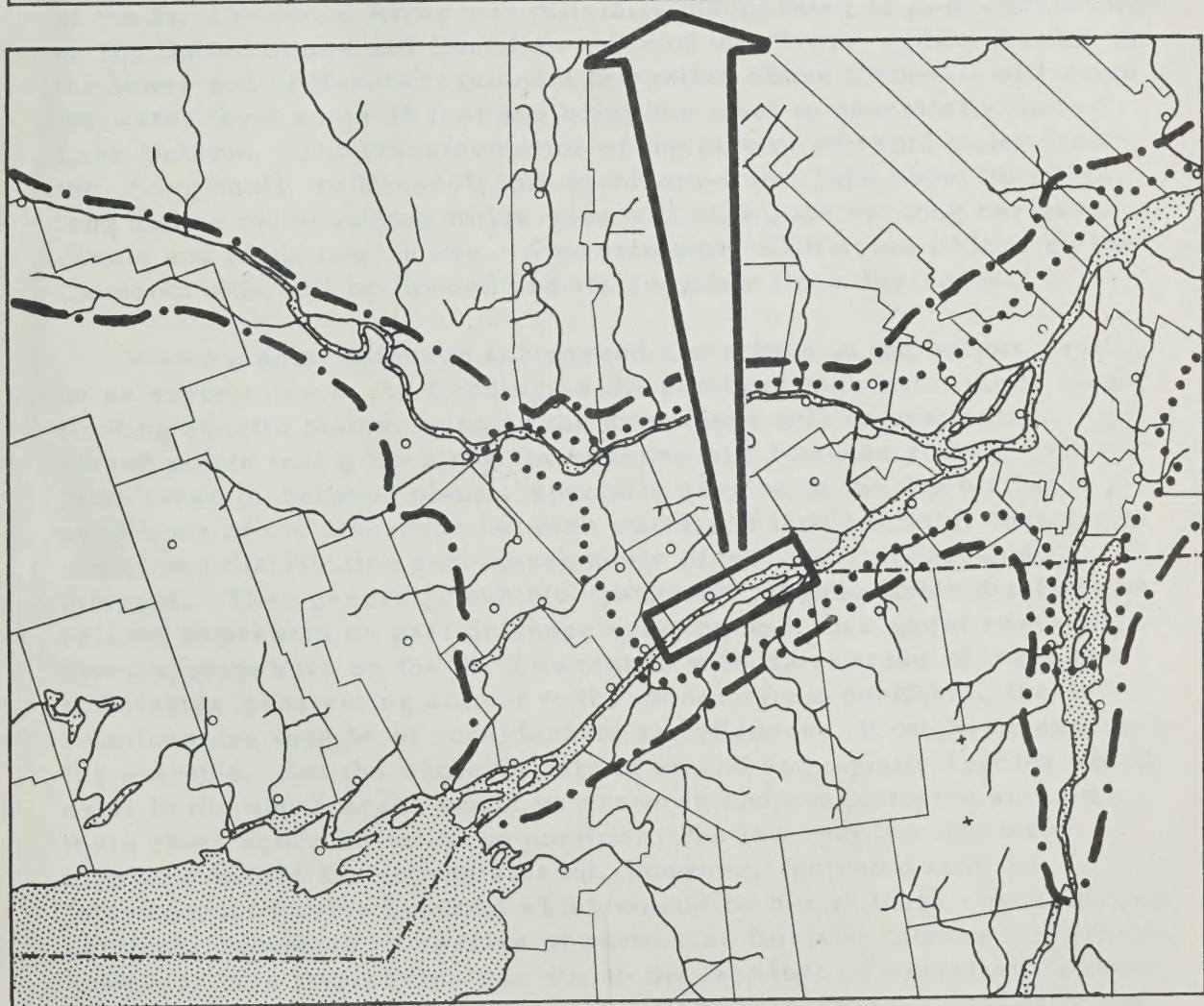
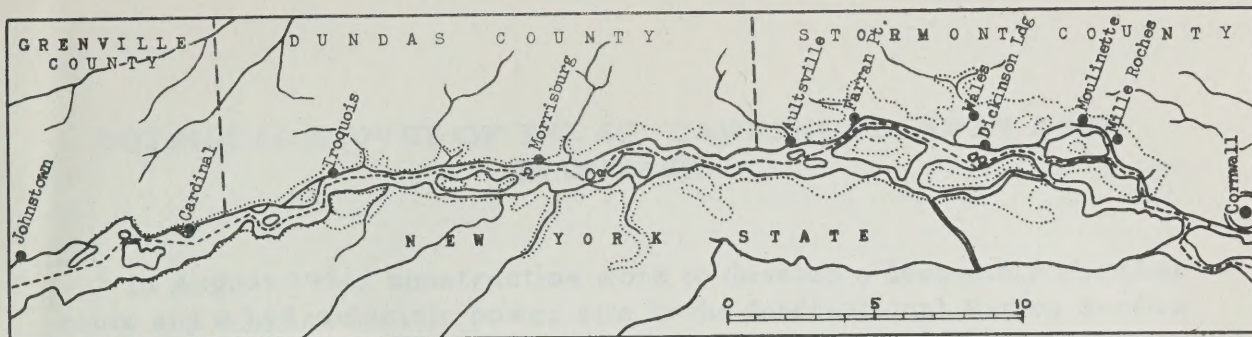
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The enlarged chart of the International Rapids Section of the St. Lawrence River (upper map), showing the towns on the Canadian side, also shows the approximate limit of flooding (dotted contour) drawn at 238 feet at the lower end (at right) and 245 feet at the upper end. All survey sites were located below this contour.

On the lower map are indicated the maximum limits of the two postglacial seas which covered the area, the Champlain Sea (dash-dot line) and the subsequent Ottawa Sea (dotted line).



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## BOTANICAL SURVEY OF THE ST. LAWRENCE SEAWAY AREA IN ONTARIO

In August 1954, construction work to develop a deepwater shipping route and a hydroelectric power site in the International Rapids Section of the St. Lawrence River was officially inaugurated at joint ceremonies on the United States and Canadian sides of the river. A dam located at the lower end of Barnhart Island a few miles above Cornwall will raise the water level some 95 feet and bring the level to essentially that of Lake Ontario. The transformation of the stretch of rapid water from the Long Sault to Prescott into a smooth-water lake about 30 miles long and as much as four miles wide will eliminate the long series of canals and locks now in use. Approximately 8000 acres of land on the Canadian side will be flooded and its complete flora destroyed.

Water plants, although submerged and rooted in the bottom, will be as susceptible to the flooding as the plants of high land. Only free-floating aquatic plants, such as the duckweeds will be unaffected. Strand plants that grow along the beaches will likewise suffer. It is often these in-between plants, specially adapted to the fluctuating conditions of the transition between water and land habitats, that are of restricted distribution and consequently of much phytogeographic interest. They generally exhibit "patterns" of geographic distribution related to present or past drainage systems and, in a great east-west river system such as the St. Lawrence, with its expanse of lakes and tributaries penetrating almost to the center of the continent, these relationships may be of considerable significance. It might be expected, for example, that the whole variety of strand and aquatic species which exist in the upper areas would be drawn in and concentrated along the main river shore in its lower portion. The few records that were available before the survey started, however, indicated that the International Rapids Section, which should be one of these concentrating sections, contained no species of particular floristic interest. Perhaps, however, this impression was due to the fact that no systematic survey had ever been made in the area and it seemed necessary to clarify the situation.



As yet, problems concerned with the natural occurrence of species in Eastern Canada have scarcely been investigated, but it was conceivable that when this could be done records from the Seaway area might prove fundamental to the interpretation of the flora of the whole St. Lawrence basin. For example, since the general movement of vegetation into Canada following deglaciation was northward, the flora of the Seaway area should have a close bearing on that of the region immediately to its north, in the lower Ottawa Valley. On the other hand, the St. Lawrence River might be thought of as presenting a formidable barrier to the northward overland migration of dry-land species. With such matters as these in mind, it also seemed desirable to put on file in the form of specimens and authentic records, some data on the present state and composition of the local vegetation before it was permanently eliminated.

The new habitats created by the flooding will soon be colonized by plants. Colonization will be mostly by species already present in the area. Some may be expected to spread to the new habitats and colonize them, even in greater abundance than is now present. For example, the introduced pondweed, Potamogeton crispus, which is now relatively scarce and held in control by the other well-established aquatics, may spread and occupy the shallow waters of the new lake in great profusion. Land disturbed by construction of new roadways and townsites will provide fresh openings for the establishment of adventive species, perhaps ones entirely new to the area brought from afar and introduced by the agencies of modern transportation. A record of the existing flora was therefore needed as a basis for future comparison.

#### METHOD OF SURVEY

Field work was started in 1953 and continued during the summer of 1954. Trips of two days' duration were made from the Ottawa Laboratory and, in all, about 20 working days were spent in the area. While this time was inadequate for intensive search, it was felt that during it all significant sites were visited. The localities visited and to which reference is made in the report, are indicated on the map. This map is reduced from the official chart supplied by the Department of Transport showing in greater detail the proposed levels of flooding.

Specimens were collected and lists of species made at various



sites, but no attempt was made to describe and map the vegetation in general. The flora of agricultural land was given only passing attention because it consisted largely of alien species and was similar to that of adjoining fields which will not be inundated. Rough woodland, such as results from abandonment of fields, is likewise much the same as secondary growth throughout eastern Ontario. Main emphasis was therefore placed on locating examples of original, or near-original, vegetation. In long-settled areas, undisturbed vegetation exists to a very meager extent and when present is confined chiefly to aquatic habitats or to land-types too steep, irregular or wet for plowing or grazing.

## GENERAL FACTORS THAT HAVE INFLUENCED THE VEGETATION

### Relief

The International Rapids Section of the St. Lawrence Valley is essentially one of low relief, the river flowing in an almost straight course through a gently sloping and featureless valley. There are no deep-cut channels, meandering courses or bordering benchlands, hence the valley must be considered as one of considerable immaturity. There are neither bed-rock outcrops, rock-walled ravines or cliffs, nor sand dunes or bogs to provide the habitats required for the development of special plant associations.

### Soil materials

The whole area is mantled with a deep layer of glacially transported soils. These are tills (loams, sandy loams, gravelly loams), bouldery moraines, or sandy outwash material spread out in level tracts. Very little, if any, alluvial clay such as forms the broad plains to the north and east, is superimposed on top of the till and glacial outwash materials in the area. This presents a puzzling situation in view of the fact that the area was submerged for a long period under the same postglacial sea or seas that covered the adjacent clay plains and caused their formation. Presumably, such fine sediment, if it was deposited uniformly, was later washed off from the till by currents or waves and carried away by the receding tides of the postglacial sea. The former existence of broad currents flushing across the present St. Lawrence trough in a northeasterly direction from the Adirondack upland and the

foot of Lake Ontario towards the Ottawa Valley is suggested by:

(a) the directional pattern of soil types as revealed in aerial photographs and in the soil maps of Grenville, Dundas and Stormont Counties, (b) bands of sand (represented, for example, by the Manotick sandy loam) washed over the clay in an northeasterly direction, (c) the orientation of tributaries entering the St. Lawrence, from the northeast, presumably following old channels once continuous from the Adirondacks to the sea, but later pirated by the St. Lawrence. Perhaps, on the other hand, the clay which was supplied by the glacial waters discharging into the sea from the north was prevented by the currents from reaching the area. There are, however, vestiges of alluvial clay in the depression of Hoople and Aultsville Creeks. As a third postulation to explain the absence of wide tracts of alluvial soil, the presence of a large block of stagnant glacier, resting as an island of ice on the area throughout the period of clay sedimentation, may be suggested. The former existence of large stagnant ice masses has been substantiated in regions farther down the St. Lawrence Valley. Whatever the details of past events may be, it is rather certain that the area along the St. Lawrence was not available for occupation by plants until relatively late in prehistoric time, perhaps not until a few thousand years ago, and long after the surrounding terrain was vegetated.

### Drainage

The uplift of the land following deglaciation, starting from the hinge-line south of the Adirondacks and progressively greater to the north, drained the postglacial sea or seas, and also allowed the St. Lawrence to take up its present course as the sole outlet of Lake Ontario. In the process, the St. Lawrence cut off various streams flowing in a northerly direction from the Adirondack mass. This uplift for the first time exposed a relatively broad and continuous landmass east of Lake Ontario on which the northward migration of plants could take place. Perhaps for a time the discharge from Lake Ontario may have been slight because of the prevailing arid climate, and the St. Lawrence may have been very small or nonexistent. Or, perhaps, the waters of Lake Ontario may even have found other outlets (through the Rideau, the Moira-Mississippi system, Kemptville Creek, or the South Nation) and the migration path of plants may have been directed towards the valley of the Ottawa rather than down the St. Lawrence. Physiographic evidence has not yet been sought to support such a contention, but the



present-day distribution patterns presented by some species would seem to indicate that such a diversion took place. Study of certain deltaic sand deposits disposed to the east and northeast of the present Rideau, may lead to confirmation. The present height of land from Brockville to Cardinal preventing the waters of the St. Lawrence from flowing into the deeper Ottawa Valley, is less than 50 feet in elevation and runs at a distance of only a mile or so to the north. Farther down the valley from Cardinal the divide withdraws more from the St. Lawrence but even at its greatest distance provides a watershed of no more than five miles' width. Consequently, no tributaries of significant size enter the River from the north. Hoople Creek through Wales, and Hosaic (Nash) Creek just east of Morrisburg are the chief streams. The fact that they lack several of the plant species (for example, Potamogeton amplifolius, Pontederia cordata, Polygonum hydropiperoides, Saururus cernuus) to be found in the upper reaches of streams of the South Nation drainage on the opposite side of the divide is indication of their mode of origin and the short duration of their existence. Some species that have migrated directly down the St. Lawrence have not yet had time to migrate very far up the tributaries; most have not spread beyond the mouths of these streams.

### Human factors

The drastic effects produced on the vegetation by the activities of man are obvious in the landscape. The region was settled early and for many years has been developed agriculturally to its economic limit. The high level of agricultural development of the region is due not so much to inherent fertility of soil, but to the fact that the region is located on one of the most important trade and travel routes in Canada, that between our two largest cities (Figure 4). The main routes of both railroad and highway between Montreal and Toronto converge and parallel the shore because of the northward bend in the river. The land on the United States side, where soil and climate could be considered identical, is, in contrast, not developed to the same degree because traffic routes have not become so concentrated. Cornwall, Cardinal and Prescott have developed into industrial centers, but the other settlements along the river, Morrisburg, Iroquois, Aultsville, Mille Roches, Moulinette, Farran Point and Dickinson Landing are still essentially agricultural towns and probably had their origin at lock sites or transfer points along the River when it was the sole route of travel and commerce. Numerous waterfront

properties are occupied by summer cottages and tourist cabins in spite of the fact that the area is not so attractive for resort development as the Thousand Islands portion upstream.

The intensity of settlement has been mentioned here because it gives an easy measure by which the present sad state of the original vegetation may be judged. Natural vegetation is essentially nonexistent. Instead, an "artificial" vegetation composed of plant communities in early stages of succession and dominated almost entirely by adventive species covers the land. All land, except the rockiest moraines and the wettest depressions, has at one time been plowed and the remainder may be assumed to have been exposed to heavy grazing. Shoreline and aquatic habitats have been altered also. About half the total length of shore between Cornwall and Prescott is lined with graded or masonry banks, constructed to accommodate the present canal system (Figure 1). The native plants along the remaining sections of shoreline have been influenced by another factor, a biotic factor, namely, the crowding and shading by an introduced strain of reed canary-grass which has lately colonized the wet habitats and produced a dense and almost continuous stand (Figure 52).

### Climate

There appears to be nothing in the vegetation or its component species which would indicate that the climate is in any way different from that generally prevailing over the whole Ottawa - St. Lawrence lowland. The local presence of a few species such as May-apple, shag-bark hickory and filbert, which do not grow along the Ottawa River some 50 miles to the north, may be explained by factors other than a more favorable climate. On the other hand, the dearth of species (relative to the Ottawa Valley) is not necessarily due to a less favorable climate. While the field crops are similar, the number of commercial orchards between Aultsville and Cardinal would seem to indicate that for apples conditions are more favorable here than in the Ottawa Valley. It may be that the gentle slope to the St. Lawrence provides the air-drainage necessary for successful orcharding.

A "snow-line" is popularly recognized, at least by ornithologists who have observed the winter range of seed-eating birds, as running parallel to the St. Lawrence several miles to its north. Weather records have not been searched to substantiate the existence of such



a line, but during the winter of 1954-55, it may be recounted, heavy snow persisted from November to March in the Ottawa District while along the St. Lawrence, the land was bare much of the time. A climatic feature such as this could be expected to have effect on the vegetation but, as already mentioned, no difference has become apparent.

## DESCRIPTION OF THE FLORA BY AREAS OR HABITATS

Present-day fragments indicate that the original forest which covered the well-drained terrain was rather typical of the Great Lakes Forest or Hemlock - White Pine - Hardwood Forest Formation. The predominant hardwood species were sugar maple, beech, basswood, yellow birch and red oak. The poorly drained land seems to have been under an association of elm, ash, red maple and white pine. Elements of the Boreal Forest are notably scarce and it is apparent that this Formation bypassed the area in its northward migration. The composition of the existing patches of forest will be treated later when the other units, progressing from the aquatic sites, through the strand, to the upland sites, have been discussed.

## THE ISLANDS

The nine islands in the Canadian portion of the River, listed in order upstream, are: Sheek, Grassy, Wagners, Steen, Indian, Doran, Canada, Toussaint, and Adams. All are of relatively low elevation and will be completely or almost completely submerged. Those portions of Sheek, Toussaint and Adams that will not be covered will undoubtedly be so modified by construction work or subsequent landscaping that the small remaining patches of vegetation will be destroyed. The original vegetation on Doran and Adams has long been completely eliminated through clean clearing and continuous grazing and the islands are essentially naked of trees. The same statement is true for large portions of most of the other islands. Only Grassy Island, which is little more than a sandbar, and Indian Island, which is quite small, have escaped agricultural development and remain in a relatively unmodified state.

All islands are composed of glacial soils similar to the mainland in textural and parent material and are not outcroppings of bedrock as are those in the Thousand Islands Section upstream. Their general conformation, lack of actively eroding or undercutting banks, and lack of surface fluvial deposits would indicate that water levels and currents

have not fluctuated much in the past and that the shoreline has long been stabilized. The banks exposed to the current at the head of the islands are usually steep and pass through a bouldery strand into a similar bouldery bottom for as far as one can see into the water. At the foot of the islands and along quiet shores the strand is sandy, or in places muddy, and slopes more gradually into a bottom of similar materials. Alluvial bars have formed below most islands, but these are not pronounced as in more mature river beds.

Sheek Island, about two miles long, is the largest of the Canadian islands and lies opposite the larger Barnhart and Long Sault Islands of the United States side. The main current of the Rapids bears only on a small portion of the upper shore of the Island before it veers off to pass on the south side of Barnhart. Only a relatively short stretch of its shoreline, therefore, now possesses habitats influenced by spray from the turbulent waters of the Long Sault. The former channel of the rapids along its north side has been blocked off by dams at either end to form Bergen Lake and for several decades its whole northern shore as well as that of the opposing mainland has been flooded.

Sheek is the only island connected to the mainland by a bridge and by a surfaced road which runs its entire length. It is the only one with a well-developed and permanent agriculture and has several fine farms. Only about two per cent of its area has escaped clean-cutting and cultivation. This portion consists of a sugar bush of a few acres' extent at the upper end adjoining Ault Park, a narrow strip cut off by a diversion channel from Bergen Lake at the lower end and occupied by summer cottages, and of a couple of farm woodlots in the middle.

Most plant collections have been made at Ault Park, a public recreation ground set aside as a memorial park (Figure 32) overlooking the historic Long Sault. It has some fine trees of pine, maple, hickory, butternut, oaks and basswood. The cleared but rough land around Ault Park supports a magnificent stand of wild bergamot (Monarda fistulosa) which is not of general occurrence in the area. The collections of W.H. Minshall were made chiefly in this vicinity in 1941 and contain a high proportion of adventive species. The bank down to the roaring waters of the rapids is steep, of loose gravel, and almost inaccessible. Only two native species of interest, Agropyron trachycaulum and Arabis divaricarpa, are localized on it in the thinly wooded cover.



One would expect to find more species of interest in such a habitat! The high bank continues past the rapids to a cove created by a backwater from the Long Sault, where the slope is of clay and, due to seepage from a capping of sand above, is sodden and subject to slumping. As a consequence, it has been preserved from grazing and from ready access of humans, and provides a sheltered niche for a rich variety of ferns, herbs, shrubs and wild flowers (Figure 34). Such rarities as Hamamelis, Sphenopholis, Dentaria and Apios are found here. The fine soil carried out from the slope has formed itself into an alluvial meadow along the shore where, although exposed to grazing, a wide variety of Carex, Eleocharis, Juncus and Equisetum occurs (Figure 33).

The southern shore of Sheek Island along the quiet channel between it and Barnhart Island has a steep clay bank fringed along the crest with scattered oaks and hickories (Figure 36). It has been grazed almost continuously and even the slopes of the bank are open and trampled by cattle. There is, however, towards the center of the shore, a small gulley kept clear of cattle by fences. This is the habitat of Lobelia siphilitica, the only site for the species. The woodlots in the interior above this shore are of dense poplar and willow merging into maple sugar bush in which there has been planting of Scots pine.

The old channel at the lower end of Sheek Island has cut itself down to the bedrock, a limestone visible as ledges under the water. This was the only exposure of rock encountered in the area to be flooded. Presumably the limestone underlies the narrow flat which extends out from the base of slope at this end of the island. This flat is covered with a springy and mossy meadow that is kept saturated with water apparently seeping out over the limestone from the dam above, and supports such interesting species as Selaginella apoda, Cladium mariscoides, Panicum flexile, Gerardia and Lobelia kalmii. The large limestone quarries from which the blocks for the canal were obtained are located a distance north of the river.

Grassy Island, except for a small area at the upstream end, is essentially an alluvial bar (Figure 7). The whole lower portion is wet or under water. It has a fringe of Typha and dense Scirpus validus, with Lythrum and Butomus scattered in the marsh toward the center (Figure 8). Dulichium arundinaceum is present here only. The high end was not visited but Populus grandidentata, P. balsamifera, Alnus rugosa, Rhus typhina and Ulmus americana were seen from the boat. There was

a margin of Phalaris about the shore.

Wagners Island, situated immediately upstream from Grassy Island, has been grazed and cut (Figures 9 and 10). Vegetation at the swampy lower end approximates that of Grassy Island with the usual stands of Typha, Scirpus, Sagittaria, etc., but with considerable Calamagrostis on the drier portions. Trees on the upper higher end include Pinus strobus, Populus balsamifera, P. tremuloides, Quercus rubra, Carya ovata, Tilia americana and Crataegus. The only collection of Astragalus canadensis was made on the bluff at the upstream end.

Steen Island, a little over half a mile in length, is easily accessible across a relatively quiet channel from the Aultsville wharf. Its lower half is bare of trees and has long been continuously grazed, but recently, because stock have been removed, it has grown up to a coarse stand of pasture grasses and weeds, all adventives: Kentucky blue-grass, redtop, couch-grass, timothy, dandelion, yarrow and thistle.

A block of 20 or 30 acres at the other end has been developed as a maple sugar grove and contains a remarkably pure stand of maple, mostly very large trees (Figure 39). Sugaring operations, however, ceased a few years ago and sapling growth now makes the woods almost impassible (Figure 40). The woodland herbs are surprisingly few in number, probably because the woods were grazed until recently, but they show considerable variety: Trillium grandiflorum, T. erectum, Podophyllum peltatum, Hydrophyllum virginianum, Polygonatum pubescens, Phryma leptostachya, Maianthemum canadense, Actaea pachypoda, Viola spp., Galium triflorum, Heracleum lanatum, Aquilegia canadensis, Arenaria lateriflora, Comandra richardsiana, Solidago caesia, S. flexicaulis, Cryptotaenia canadensis, Osmorhiza longistylis, etc. Other portions of the Island were variously utilized but have now reverted to heavy thickets containing much Crataegus, Celastrus and coarse growth of arborescent species, some, such as Jack pine, white spruce and rowan, giving evidence of a meager attempt at reforestation.

Indian Island, of about 10 or 15 acres in extent and about midway in the stream not far below Morrisburg, is the least disturbed of the islands (Figures 11 and 12). It apparently has never been clean-cut at any one time and many large trees exist. Chief among these are basswoods which, although large, always occur in groups which indicate their origin from stumps. Other large trees are elm, red oak, bur oak, ashes, white



birch, shag-bark hickory and ironwood. There is a surprising absence of beech, yellow birch, white pine, hemlock, cedar and blue beech, and only a single small tree of sugar maple. The forest is quite open under its high canopy except for the waist-high growth of poison ivy, loosestrife, enchanter's nightshade, tall nettle and black currant. Introduced species are mostly absent and exist only in a small grassy clearing in front of an abandoned cottage at the north side. Phalaris, Tanacetum and Pastinaca, so abundant on the mainland shore, for example, have not yet reached the island. Also no Crataegus, Rhus typhina, Alnus, Populus balsamifera or Monarda occur. No unique native species were found, but several of limited occurrence, such as Ilex verticillata, Lonicera dioica, Sanguinaria canadensis, Heracleum lanatum and Prunus serotina, were present.

Doran Island, lying beside Indian Island and much larger than it, has apparently been used as a cattle range for many years and is bald of trees, except for the odd willow, pine and cedar along the shoreline. It was not visited.

Canada Island above Morrisburg was not visited. It appears to be used for recreational purposes and has well-tended lawns and plantings.

Toussaint Island is similar in size and shape to Steen and has possibly had a similar history although the woods at the upper end are of distinctly different composition. It has been intensively grazed, and the fine quality of the sward in the permanent pasture on the lower unshaded portion attests to the value of such land for the purpose (Figure 14). It is a close green stand essentially of white clover and Kentucky bluegrass with lesser quantities of the usually associated herbs, dandelion, buttercup, plantain, yarrow, timothy, red-top and red fescue. The only unpalatable plant is thistle.

The upper half is an open "parkland" of towering, widely spaced and remarkably clear-trunked trees, chiefly elm but with scattered individuals of shag-bark hickory, bur oak, red oak, basswood, butternut and slippery elm (Figure 17). Sugar maple, beech, yellow birch and pine are entirely absent and no shrubs or small trees seem to be invading. There is no evidence of recent cutting or fire and the composition of the tree stand and its development is difficult to interpret. The only herbaceous native reminiscent of the original forest is May-apple which occurs as several patches (Figure 15) in the otherwise grassy stand of adventives that form

the dense ground-cover. Perhaps heavy selective cutting followed by continuous grazing eliminated, and then prevented the re-establishment of, the maple, beech and pine and their characteristic under-species. Some of the elms show an unusual, gentle but obvious curve high in the trunk (Figure 16).

Adams Island in the Galop Rapids is devoid of trees and was not visited.

## THE WATER HABITATS

The vegetation submerged in the waters of the St. Lawrence may be treated under four groupings, that of the rapids, the deeper channel of the river, deep water of back channels and canals, and shallow embayments.

The rapids at the Long Sault are among the most violent to be encountered on any river and it is highly unlikely that attached seed plants exist, submerged in the turbulent waters (Figure 31). Search was made for Podostemum ceratophyllum at a few likely places along the shore of the rapids but none was seen. The water-washed rocks, however, are clothed with a solid green mat of a filamentous alga, possibly Ulothrix.

The deeper channel of the River where the current is still quite fast probably has a luxuriant bottom-rooted vegetation, but this was difficult to observe except at a few points. Off Iroquois, in 8 feet of water, dense beds of the pondweeds, Potamogeton vaginatus, P. richardsonii and P. illinoensis, with stems up to 10 feet long, stream out almost horizontally with the current and weave back and forth in billowing stands completely submerged. The first two of these species, at least, bore flowers and fruits under water; the latter appeared to be sterile. Vallisneria is usually admixed with these potamogetons, and, in general, is the main aquatic in the fast as well as slow water almost everywhere.

The deep water in canals and in slow backwaters of the River is usually almost clogged with Vallisneria, Potamogeton richardsonii, Heteranthera dubia, Elodea canadensis and Myriophyllum exalbescens. These water-weeds are rooted in the bottom and create dense beds up to four or five feet thick. The clarity of the water allows the development of a luxuriant submerged vegetation in the canals as well as in the river. The foliage of aquatics in slow waters is coated with a grayish precipitate



of lime that indicates in addition a favorable supply of minerals. In some of the disused canals, particularly just below old locks where water wells up through crevices to provide additional aeration, the growth of water-weeds is particularly lush. In the shipping canals, however, the growth of weeds is chopped up by the propellers of the vessels and the fragments, particularly those of Vallisneria, float on the surface, often accumulating in great tangled masses above the sluices in the locks. Potamogeton crispus also appears frequently as floating fragments but its source is somewhat of a mystery since rooted plants are not frequently encountered. As this is the only alien pondweed in the region and propagation by seeds is unknown, its occurrence in interior waters has always been of interest.

In September, the large bushy panicles of Alisma graminea, which can bloom and mature under water, extend to the surface and almost completely fill the unused channel above Iroquois. It also occurs, but in less noticeable abundance, elsewhere in shallow water (Figure 44). Ceratophyllum demersum, although not bottom-rooted, is usually present in considerable abundance, firmly enmeshed in the other aquatics mentioned. Chara generally coats the rocky bottom of canals and the river where seed plants are absent and sometimes it forms extensive, apparently pure, carpets.

Shallow embayments where a deep alluvium has deposited on the bottom, are usually occupied by continuous mats of the usual aquatics (Vallisneria, Potamogeton richardsonii, Myriophyllum), but some plants such as Elodea canadensis, Callitriche hermaphrodita and Lemna trisulca become locally predominant, or colonies of Nymphaea tuberosa become interspersed. Marshes of Scirpus validus, Typha, Sparganium eurycarpum, Eleocharis smallii and Sagittaria rigida line these shallow bays or a strip of Scirpus offshore, may cut them off from the main river course.

## THE SHORELINE SWAMPS

Reed swamps are not so extensive in the International Rapids section as elsewhere in the St. Lawrence system where greater expanses of shallow alluvial flats are available. Nevertheless, the physiognomy and species content of the swamps are essentially the same. Scirpus validus is often foremost in invading the water and is followed or invaded by Typha or Scirpus fluviatilis (Figure 28). Very few other species

enter into these shoreline swamps. In special places, however, there are large patches formed of Sparganium eurycarpum, Acorus calamus, Eleocharis smallii, or other emergent aquatics. No extensive stands of Zizania or Spartina are present as elsewhere in the River and Butomus umbellatus and Lythrum salicaria, although already widely distributed, have not yet become prominent.

## THE SHORELINE MARSHES

The Typha swamp generally grades on the shoreward side into a Calamagrostis canadensis marsh in which there is a great mixture of wet meadow species: Iris versicolor, Carex lasiocarpa, Carex aquatilis, Aster simplex, Impatiens capensis, Lythrum salicaria, Sium suave, Verbena hastata, Eupatorium perfoliatum, Phalaris arundinacea, Poa palustris, Leersia oryzoides, Cicuta bulbifera.

## BOULDERY SHORELINES

Where the bank is quite steep to the open flowing waters of the River, the shoreline consists of rounded boulders below the surface and for a few inches above (Figure 25). Attached green algae (Cladophora) (Figure 27) and the red fibrous roots of willows are often the only visible plant growth. Just above the summer waterline, the algae on the rocks become browned as they are exposed, and above these an accumulation of plant and miscellaneous debris is generally present (Figure 25). The dead, washed-up stems of Scirpus validus covering the boulders and enmeshing assorted garbage and jetsam, often provide thatch-like heaps along the shore. In other places finer and more tangled masses of debris are formed by the remains of submerged waterweeds, Vallisneria, Elodea and Ceratophyllum in particular (Figure 26). Herbaceous plants do not grow through these blankets of debris and consequently there is generally a band of a foot or two which is free of vegetation, to mark the high-water line. Trees, of course, overshadow it and woods of willow, elm, ash and silver maple ordinarily skirt the shore. The tree willow present is the crack willow (Salix fragilis) which propagates quickly from broken branches. The almost continuous stand of individuals of this species probably has developed from fragments from some early introduction far upstream (Figure 51).



## SANDY OR GRAVELLY SHORELINES

Strands consisting of the more finely textured beach materials are not extensive, seldom attaining a width of more than four or five feet. This condition is due to the relative constancy of water level from season to season. The range of fluctuation may be within the limits of a few inches, the lowest level occurring in the fall. In this respect the International Rapids Section of the St. Lawrence is probably a unique example among Canadian rivers in that it has very narrow flood-shores. From a botanical standpoint this is disappointing because broad flood-shores are recognized to provide important habitats for the migration and persistence of many herbaceous species.

Considerable attention was given to the species present when good examples of unaltered strand could be found. As in other habitats subjected to repeated inundations and desiccations, considerable variation in composition of the strand flora occurred from place to place and generalizations are difficult. Wet sand beaches are often tied together with mats of Eleocharis acicularis, E. calva, Carex cryptolepis, Juncus nodosus, J. dudleyi, Equisetum arvense, Agrostis palustris, Potentilla anserina, Ranunculus reptans and Mentha arvensis in which scattered individuals of Lobelia Kalmii and Gerardia, blossom out in late season (Figure 42).

Where the sand is looser and tends to dry out on the surface in summer time, annual species take over completely, forming thin or dense stands, depending on the conditions. Common among these are both native and adventive species: Juncus bufonius, Panicum capillare, P. tuckermanii, Poa annua, Echinochloa pungens, Cyperus rivularis, C. strigosus, Polygonum lapathifolium, P. hydropiper, Chenopodium glaucum, Atriplex patula, Ranunculus sceleratus, Cerastium vulgatum, Medicago lupulina, Plantago major, Bidens cernua, B. frondosa, Erigeron canadensis, Xanthium strumarium, Artemisia biennis, Gnaphalium uliginosum. Also there are rare occurrences of such species as Cyperus engelmannii, Eleocharis smithii and Panicum flexile. Seedlings of tree species are often present but these, like other perennials cannot survive because of ice action.

The upper limit of the strand, protected from the waves and ice except at high-water time, is often marked by driftwood and debris, and a dense herbaceous band of biennials and perennials, chiefly adventive:

Phalaris arundinacea, Agrostis alba, Agropyron repens, Poa pratensis, Leersia oryzoides, Scirpus atrovirens, Iris versicolor, Rumex crispus, Melilotus alba, Vicia cracca, Pastinaca sativa, Lythrum salicaria, Lysimachia ciliata, Oenothera biennis, Epilobium hirsutum, Verbascum thapsus, Verbena hastata, Achillea millefolium, Sonchus arvensis, Taraxacum officinale, Lactuca scariola. Among these, reed canary-grass (Phalaris) is probably the most prominent, and in most places has come to be the species controlling the habitat to the greatest extent. In decaying deposits of wave-cast tree leaves, smothering stands of tall polygonums (Polygonum lapathifolium, P. persicaria, P. hydropiper, P. pensylvanicum) with or without mixtures of Impatiens capensis, Bidens frondosa, B. cernus, Siun suave Convolvulus sepium, Lythrum salicaria and Xanthium, form lush tangles.

## FOREST

Only a few small patches of wooded land with large trees are present in the area and none of these could be said to be in an original condition, selective cutting, grazing or fire having altered their composition and structure to at least some degree.

The best stand, although not the most characteristic of the regional climate, is probably that situated about 3 miles west of Cornwall surrounding the spring which is the source of Robinson's Creek (Figure 36). Part of the stand is of tall white pine and red maple, which although it has been managed as a producing grove in the past and has been selectively thinned and underbrushed, shows an absence of introduced species in the ground flora and indicates a nearly natural condition (Figure 35). The land is sandy and, although appearing dry on the surface, is poorly under-drained and this condition probably accounts for the interesting combination of tree dominants present as well as for the fact that it was never cleared and cultivated. The pines have a trunk diameter of 18 to 24 inches and the maples 8 to 12 inches. Other tree species present are red oak, white birch, and black cherry. The only important shrubs are the two species of hazelnut, both abundant and one, Corylus americana, at its northern limit. Characteristic species in the ground cover are: Coptis groenlandica, Maianthemum canadense, Clintonia borealis, Cornus canadensis, Trientalis americana, Mitchella repens, Uvularia sessilifolia, Rubus hispidus, Brachyelytrum erectum and several woodland ferns.



Nearby, where the slope to Robinson's Creek gives better drainage, the tree composition is quite different and includes sugar maple, beech, basswood, yellow birch and white pine, with ironwood, blue beech and hazelnuts as an understory. This combination of dominants closely reflects that of the theoretical climax vegetation, as do also the groundcover species: Medeola virginica, Smilacina racemosa, Erythronium americanum, Actaea rubra, Tiarella cordifolia, Trillium grandiflorum, T. erectum, T. undulatum, Arisaema atrorubens, Dentaria diphylla, Polygonatum pubescens, Viola spp., Caulophyllum thalictroides, Panax trifolius, Ranunculus abortivus, Mitella diphylla, Hepatica acutiloba, Claytonia caroliniana and Adiantum pedatum.

The dry morainic ridge of deep gravels and boulders (Figure 19) about a mile from the River and extending almost from Moulinette to Wales has likely had a similar deciduous forest which, however, has been greatly altered over much of its extent by management as a sugar bush or by cutting and grazing. In addition to the original dominants (sugar maple, beech, basswood, yellow birch and white pine), which are still abundant (Figure 20), there are representatives of butternut, pig-nut hickory, black maple, rock elm (Figure 21), slippery elm, red and bur oak, all of which are tree species considered to be adapted to more arid sites. The top of this ridge will remain exposed as a low island in the new lake.

Wet woods are best represented in the low area north of this morainic ridge and east of Wales. The trees dominating the woods are American elm, white ash, red maple, basswood and an occasional white pine. Large trees of white cedar may have been present formerly. Wild grape, Virginia creeper and poison ivy are characteristic woody plants. The chief herbs are: Laportea canadensis, Boehmeria cylindrica, Pilea pumila, Circaea quadrisulcata, Glyceria striata, Hystrix patula, Cicuta maculata, Phryma leptostachya, Sanicula gregaria, Lysimachia ciliata, Verbena urticaefolia, Eupatorium rugosum, Caltha palustris, Thalictrum polygamum, Carex spp. (Figure 22).

Much of the land that has been clean-cleared in the past and allowed to revert to woodland is in dense second-growth woods in which old-field birch, elm, ash, red maple, and Amelanchier may predominate. The undergrowth is often a dense stand of shrubs (Cornus stolonifera, Corylus cornuta, Carpinus carolinianus, Spiraea latifolia, Rubus) and ferns (Pteridium, Osmunda, Onoclea). The composition of second-

growth bush is most variable and depends on the nature of the soil as well as its past history.

## WEEDS

The incidence of weeds was not given particular attention but some general impressions of abundance in comparison to other areas were gained by traversing the country. For example, tansy and wild parsnip are more abundant here than in other areas known to the authors. Caraway (or perhaps it is wild carrot!) and foxtail barley, absent in the area, start to become abundant about 20 miles north of the River. Blueweed and chicory are much less abundant than, say, in Lanark County. Orange hawkweed and sheep sorrel are about as frequent as in the Ottawa District, but have acquired nothing like their abundance in southern Quebec. Elsholtzia cristata was the only weed novelty. Differences such as these in the abundance of weeds in adjoining regions are certainly not related to differences in soil or climate. Rather local features of land utilization which have influenced the chances for invasion and infestation by weeds have made a temporary difference and, given time, density can be expected to become uniform.

In concluding this section of the report, it would be fair to say that, in general, the inundation resulting from the seaway construction will eliminate vegetation of little botanical significance, in the sense of rare and isolated species, or of irreplaceable virgin stands, at least so far as the Canadian side is concerned (see Appendix A).

The list of species which follows, however, is intended to place on record information which may prove of interest in the future, even if only to indicate the absence of species. The lack of a large number of species which might have been expected to occur in the area is a rather instructive finding (see Appendix B). This is thought not to be due to drastic effects that the native vegetation has already suffered through extensive clearing, cultivation, grazing and earlier canal construction. It is felt that the area has always lacked many species which range into adjoining areas, upstream and downstream, and to the north, and this finding presents a problem which was not anticipated at the outset of the survey, but which is now revealed for future investigation. A supplement to this report, is being prepared to elaborate on the nature of the problem and suggest the direction its solution should take.



## LIST OF PLANT SPECIES

The sequence and nomenclature in the following list is essentially that of Gray's Manual of Botany, 8th edition, 1950, so no index is necessary.

An attempt has been made to summarize under each species: (a) its abundance, (b) habitat relationships, and (c) its origin relative to the area under study. For abundance, the terms common, frequent, occasional, scarce and rare are used to designate degree of incidence, considering the study area as a whole. Terms, such as abundant, numerous, sparse, few and solitary are used to describe the density in the particular community or habitat. The assessment of occurrence and density, however, is a subjective one, colored by the authors' impressions developed through familiarity with the flora elsewhere, especially in the Ottawa District. The general statement on habitat is intended to summarize the authors' concept derived after the experience in the field and does not necessarily repeat the habitat data recorded on the specimens. In the citation of specimens, habitat data are greatly abbreviated, and for full particulars the original specimens would have to be consulted. Regarding origin, an attempt has been made to classify the entries as native or adventive, or introduced if brought in intentionally. If it is considered that the plant was originally absent from the study area but entered the area since white settlement, it is recorded as "adventive", even though it is accepted as "native" (naturally and originally present) in general manuals to our flora.

Collected specimens (Coll.) are cited in sequence from east to west (upstream) with collector's numbers in brackets. Most specimens were collected jointly, but numbered according to the sequence of either author; those in the 7000 to 8000 range are of Gillett, and those in the 14000 to 15000 range of Dore. Numbers in the 1000 to 2000 range refer to collections made by W. H. Minshall on Sheek Island in 1941 and preserved at Ottawa. A few of the authors' collections have been preserved without number (designated s.n.). The master set of specimens is preserved in the herbarium of the Botany Division, Department of Agriculture, Ottawa (designated DAO). Replicated specimens, usually amounting to two or three sheets of each number, were made for distribution to other institutions.

Sight records (Obs.) are based on observations made in the field and recorded in lists, or on "grab" specimens not afforded permanent preservation.

Entries completely in brackets concern plants not actually encountered within the area to be flooded, but whose presence in closely adjoining areas makes them of interest. Lack of entry, on the other hand, does not necessarily mean absence of species in the study area; reconnaissance has not been intense enough to record every entity. However, absenteeism is a very important adjunct to any list, and in the case of species which are conspicuous enough to attract ready attention if present, their absence can be quite reliably stated. In the appended list of absentees, only those species are listed for which suitable habitats would be available.

### EQUISETACEAE

Equisetum arvense L. Common; wet sandy woods, embankments, shoreline thickets and on sand beaches where the stems are usually prostrate; native. Coll.: Sheek I., sandy slope (7646); Steen I., sand beach (7646, 15594). Obs.: numerous stations.

Equisetum sylvaticum L. Scarce; moist sandy woods; native. Coll.: Cornwall, 3 miles W, sandy woods (14439). Obs.: Aultsville Station, sandy bush.

Equisetum fluviatile L. Scarce; water of lagoons and shallow bays of St. Lawrence; native. Coll.: Morrisburg, swampy lagoon (s.n.). Obs.: Morrisburg, 4 miles E, inlet mouth; absent at most sites.

Equisetum hyemale L. Occasional; moist sandy embankments or clearings, always in dense clones; native. Coll.: Cornwall, 3 miles W, sandy clearing (15146), beech woods (7966); Sheek I., sand bank (14422); Wales, clay bank of Hoople Creek (8216). Obs.: no other stations.

Equisetum variegatum Schleich. Rare; wet shoreline of River; native. Coll.: Sheek I., lower end (7939).



Equisetum variegatum var. jesupii A. A. Eaton Rare; wet shoreline of River; native. Coll.: Sheek I., Ault Park (8058, 14405). Obs.: species not seen elsewhere.

#### LYCOPODIACEAE

Lycopodium lucidulum Michx. Scarce; woods; native. Coll.: Wales (8465).

Lycopodium flabelliforme (Fern.) Blanchard Occasional; swampy woods; native. Coll.: Cornwall, 3 miles W (14444); Farran Point (7855).

#### SELAGINELLACEAE

Selaginella apoda (L.) Fern. Probably scarce; obscure, on wet soils; native. Coll.: Cornwall, 3 miles W, marshy clearing (7692); Sheek I. springy shore, lower end (15500).

(Ophioglossum vulgatum L. One mile N. of Morrisburg in mucky bush (7830, 15080).)

#### OSMUNDACEAE

Osmunda regalis L. Frequent; wet woodland; native. Coll.: Wales (s.n.). Obs.: 5 stations between Aultsville and Cornwall.

Osmunda claytoniana L. Common; moist woodland and swampy areas; native. Coll.: Wales, woods (8454).

Osmunda cinnamomea L. Common; wet woodland and swampy areas; native. Coll.: Cornwall, 3 miles W (14442); Wales (8454).

#### POLYPODIACEAE

Pteretis pensylvanica (Willd.) Fern. Scarce; rich moist woods; native. Coll.: Sheek I., wet clearing (s.n.). Obs.: Long Sault, wet woods on shore; Iroquois, wet woods.

Onoclea sensibilis L. Common; wet woods, swampy meadows, ditches; native. Coll.: Sheek I., seepage slope (14427). Obs.: numerous stations.

Dryopteris thelypteris (L.) Gray (Tnelypteris palustris Schott.) Common; swampy meadows, wet sandy woods; native. Coll.: Cornwall, 3 miles W, woods on wet sand (14438); Aultsville Station, old field (7866).

Dryopteris phegopteris (L.) Christens. Rare; dry woods; native. Obs.: Aultsville Station, sandy woods (no collections).

Dryopteris simulata Davenp. Scarce; dry woods; native. Coll.: Cornwall, 3 miles W, beech woods (7969).

Dryopteris noveboracensis (L.) Gray Scarce; moist woodland; native. Coll.: Farran Point, woods (7864).

Dryopteris disjuncta (Ledeb.) C. V. Morton (Gymnocarpium dryopteris (L.) Newm.) Scarce; rich dry woods; native. Coll.: Sheek I., maple bush (2395); Wales, woods (7663).

Dryopteris austriaca (Jacq.) Woynar. var. austriaca (D. spinulosa (O. F. Mueller) Watt) Common; moist woods; native. Coll.: Cornwall, 3 miles W, rich woods (7638, 7669); Wales (8228); Farran Point, damp woods (7862). Obs.: Aultsville Station; Iroquois.

Dryopteris cristata (L.) Gray Scarce; dry woods; native. Coll.: Wales, woods (8236). Obs.: Iroquois, low woods.

Polystichum acrostichoides (Michx.) Schott. Scarce; dry rich woods; native. Coll.: Wales, 2 miles E, woods (8243). Obs.: Cornwall, 3 miles W, hardwood.

Dennstaedtia punctilobula (Michx.) Moore Rare; moist woods; native. Coll.: Cornwall, 3 miles W, wet woods (7678). Obs.: at no other site.

Athyrium thelypteroides (Michx.) Desv. Common; moist woods; native. Coll.: Cornwall, 3 miles W, wet woods (7980, 14441); Wales, swampy woods (7754); Steen I., maple woods (7702).



Athyrium filix-femina (L.) Roth Occasional; moist woods; native.  
Coll.: Wales, swampy woods (7784).

Adiantum pedatum L. Scarce, moist rich woods; native. Coll.:  
Long Sault, low woods (15118); Wales, dry woods (8246). Obs.:  
Cornwall, 3 miles W, woods; Wales, ash woods.

Pteridium aquilinum (L.) Kuhn var. latiusculum (Desv.) Underw.  
Common; moist clearings and sandy second-growth woods; native.  
Coll.: Sheek I., riverbank (2434). Obs.: several localities.

### PINACEAE

Abies balsamea (L.) Mill Rare; low woods; native. Obs.: east of  
Wales, a few small trees only; of more general occurrence in land to  
north (no collections).

Tsuga canadensis (L.) Carr. Rather common; characteristic of moist  
sandy woods and stream-cut banks, but not found on islands or near  
banks of St. Lawrence; native. Coll.: Wales (8461); Aultsville  
Station (14591).

Picea glauca (Moench) Voss Rare; moist sandy woods, absent from  
islands or land near the River; native. Coll.: Steen I., planted (15641).  
Obs.: planted on Sheek I., and in canal park near Morrisburg, etc.,  
but seen only once as native in moist sandy woods back from Farran  
Point.

Picea abies (L.) Karst. Some large trees planted near old residences  
along river-front; introduced (no collections).

Larix laricina (DuRoi) K. Koch Scarce; scattered trees in moist sandy  
woodland or wet elm woods, not on islands in River; native. Obs.:  
Mille Roches, wet sandy woods; Aultsville Station, sandy woods;  
Iroquois, mucky woods (no collections).

Pinus strobus L. Common; a dominant in original forest, large trees  
still remain in rocky woodlots or along shoreline properties, associated  
with sugar maple, beech, yellow birch and bur oak; often forming an  
association with red maple on flat sandy land; native. Coll.: Sheek I.,  
Ault Park (2432, 7649). Obs.: many stations, but absent on Indian I.

Pinus resinosa Ait. Red pine does not occur naturally but is sometimes used in reforestation; introduced. Obs.: west of Wales, interplanted in native woods (no collections).

Pinus sylvestris L. Scots Pine is frequently planted in the highway and canal parks and around cottages, all trees still small but fruiting; introduced. Coll.: Sheek I., planted near cottage (8421); Morrisburg, planted in roadside park (15319).

Pinus banksiana Lamb. Rare; planted near cottages; introduced; not originally present in area. Coll.: Steen I., a single small tree (15651).

Thuja occidentalis L. Common; abundant in second-growth wet woods and on dry rocky land and steep banks of the River but no solid cedar swamps occur; widely used for hedges and ornament on private grounds and in the canal parks, and cut for shooting blinds. At some points, trees colonizing old fields have a narrow columnar shape and may be escaped introductions or, perhaps, a local native race; native and planted. Coll.: Steen I., shore banks (14556); Aultsville Station, sandy field (14597); Iroquois Point, waste land (14839). Obs.: many stations.

#### TYPHACEAE

Typha latifolia L. Very abundant; a characteristic dominant of shore-line marshes, growing to heights of six to eight feet in water up to a foot or two deep, less abundant in marshes inland; native. Coll.: Sheek I. (8171); Cardinal (14902).

Typha angustifolia L. Abundant; shoreline marshes, mixed with above species or forming dense pure zones often in deeper water; native. Coll.: Grassy I. (8014); Morrisburg (8282B). At two points, colonies with interrupted or bifurcated pistillate spikes were encountered: 2 miles W of Cardinal (14901) and at Indian Island, 15 miles downstream.

#### SPARGANIACEAE

Sparganium eurycarpum Engelm. Common; forming dense pure zones or mixed with Sagittaria, Acorus and Scirpus in shoreline marshes in up to a foot of water, and on muddy shores along slow streams or swamps inland; native. Coll.: Grassy I. (8011, 8019); Steen I. (7720); Aultsville Station (14595).



Sparganium americanum Nutt. Rare; muddy streams; native.  
Coll.: Aultsville Station, oozy bottom of stream (14604). Obs.: no other stations.

## ZOSTERACEAE

Potamogeton filiformis Pers. var. borealis (Raf.) St. John Frequent; in quickly flowing shallow water of St. Lawrence only, rooted in gravel bottom; native. (This wide-ranging northern species here appears to be far removed from other known stations and its identity may be open to question). Coll.: Sheek I., shallow water (2437); Crysler Farm, dense bed in fast shallow water (15520); Iroquois Point, quickly flowing water (14842).

Potamogeton vaginatus Turcz. Common; only in deep fast water of the River, often forming dense beds with the long stems weaving back and forth in current; native; a wide-ranging species, here far removed from other known stations. Coll.: Grassy I., 3 to 5 feet of water (8007); Iroquois, extensive beds in fast water 8 feet deep (15436).

Potamogeton pectinatus L. Common; sluggish or flowing water of the River and its tributary creeks; native. Coll.: Long Sault, dense beds in shallow backwater (15481); Grassy I.; 3 to 5 feet of water near shore (8006); Wales, 1 foot of water in Hoople Creek (8211); Aultsville, abundant in 4 feet of flowing water (15583); Aultsville Station, abundant in slow stream (14603); Morrisburg, dense stand in canal (15304); Cardinal, muddy inlet (14913). Obs.: many records.

Potamogeton robbinsii Oakes Rare; shallow water; native. Coll.: Sheek I., running water over limestone in old channel below dam (7937). Obs.: not seen at any other point in study area; usually common in rivers elsewhere.

Potamogeton crispus L. Frequent; always as single plants or sparse stands in slow moving waters of St. Lawrence or the canals, except for one shallow muddy inlet where dense masses formed; presence of fragments floating in the canal at Cornwall indicating perhaps dense stands upstream. Introduced from Europe and formerly known from Richelieu, Rideau, Trent and Niagara Rivers in Eastern Canada. No fruits are produced but the brittle stems apparently have been dislodged and carried along by the larger vessels; not yet present in small water-

courses. Coll.: Cornwall, fragments floating in canal (15143); Sheek I., a few plants in deep water below dam (15504); Aultsville, a few plants in muddy bay (15676); Morrisburg, single clump in 3 feet of water in back-current at entrance to Rapide Plat canal (15421); Iroquois, slow water of power-house canal (15434); Cardinal, choking muddy inlet (14912). Obs.: no other locations.

Potamogeton zosteriformis Fern. Scarce; quiet waters; native. Coll.: Dickinsons Landing, still water, mouth of Hoople Creek (15524); Morrisburg, a single stem, shallow cove of St. Lawrence (15443). Obs.: not seen elsewhere; not so abundant as in Rideau and other rivers.

Potamogeton foliosus Raf. var. macellus Fern. Rare; stagnant pools; native. Coll.: Morrisburg, dense mass in late-season puddle of stream-bed (15372).

Potamogeton berchtoldii Fieber var. acuminatus Fieber Rare; shallow water; native. Coll.: Morrisburg, in St. Lawrence (15345).

Potamogeton nodosus Poir. Scarce; moving water of River; native. Coll.: Aultsville (14571).

Potamogeton natans L. Common; slow streams and muddy inlets to St. Lawrence, but not in the River itself; widespread; native. Coll.: Wales, Hoople Creek (8213); Morrisburg, shallow inlet (14947).

Potamogeton gramineus L. Frequent; quiet or flowing shallow backwaters of St. Lawrence; widespread native. Coll.: opposite foot of Barnhart I., backwater (15509); Sheek I. (8079); Aultsville (15584); Crysler Farm (15522).

Potamogeton illinoensis Morong Deep fast water of the River, mixed with P. vaginatus and P. richardsonii; native. Coll.: Iroquois, sterile plants presumably of this species (15437).

Potamogeton richardsonii (Benn.) Rydb. Very common; abundant in quiet waters of St. Lawrence or its inlets, often in equal admixture with Elodea, Myriophyllum and Vallisneria and almost clogging slow canals; in deep fast water forming extensive beds which weave in the current, generally flowering even if submerged; widespread native. Coll.: Grassy I., 3 feet of water along shore (8005); Steen I., shallow water



(14546); Aultsville, deep fast water (15586, 15587, 15602), muddy bay (15677, 15678); Morrisburg, dense beds in muddy inlet (15285); Iroquois, submerged in 8 feet of fast water (15438), dense masses in canal, 8 feet deep (15426), clogging old canal (15431); Toussaint I., shallow cove (15302); Cardinal, weed-choked inlet (14914); 3 miles below Prescott, shallow beach (14896).

Zannichellia palustris L. Rare: flowing shallow water of the River; native; formerly known downstream at Coteau-du-Lac, but not westward until Lake Erie. Coll.: Sheek I., 2 feet of water, gravel bottom, by Ault Park (7613); Crysler Farm, shallow flowing water (15521).

#### NAJADACEAE

Najas flexilis (Willd.) Rostk. & Schmidt Possibly widespread and abundant in deep quiet waters of St. Lawrence, but not often seen; native. Coll.: opposite Barnhart Island (15511); Dickinson Landing (Victorin 56823); Morrisburg, backwater 3 feet deep (15422). Obs.: Steen I., sandy bottom.

#### ALISMATACEAE

Alisma gramineum C.K. Gmel. var. gramineum Common; particularly abundant in quiet bays and in the abandoned canal above Iroquois, the tops of the panicles extending above four feet of water in profusion, also in flowing water where completely submerged; native. Coll.: opposite foot of Barnhart I., flowers open beneath surface in 2 feet of water (15512); Steen I., beach (7834); emergent in shallow water (14580); Aultsville, submerged in fast water (15568); Morrisburg, submerged in slow water, canal (15425B); Iroquois, clogging shallow waters of canal, reaching surface (15425A); Toussaint I., muddy cove, emergent (15393). Obs.: common, at many stations, but none up tributaries. Formerly known in Richelieu and lower St. Lawrence as far up as South Lancaster, but not in Great Lakes.

Alisma gramineum var. geyeri (Torr.) Samuelsson Common; often more abundant than typical variety and growing with it, the individuals usually congregated; completely submerged in shallow, slow or flowing water on sandy or soft bottoms; native. Coll.: Aultsville, shallow water (15604); Morrisburg, submerged (15346); Iroquois, submerged (14820); Iroquois Point, submerged (14841); Toussaint I., abundant,

submerged in shallow water (15386); Tuttle Point, completely submerged (14860). Obs.: at many points, all in St. Lawrence River proper.

Alisma triviale Pursh Common; muddy shores of inlets and lagoons along the River, also in wet depressions; widespread native. Coll.: Cornwall, roadside ditch (1269); Grassy I., muddy interior of island (8021); Wales, wet meadow (7780); Iroquois, muddy stream bank (14637). Obs.: abundant at several other stations along inlets or entering streams, but none along the shore of the River proper.

Sagittaria rigida Pursh Common; characteristic of shallow water of bays, lagoons and lower reaches of inlets of the St. Lawrence (not up tributary streams beyond mouth), rooting in soft oozy bottoms and spreading in beds by tuber-bearing rhizomes. In deep water the emergent leaves are all linear, angular and brittle-pithy (forma fluitans (Engelm.) Fern.), but on mud, blades are differentiated from the petiole and sometimes have slender basal lobes (forma rigida); oval-bladed forms are not present; native. Coll.: Aultsville, beds in quiet inlet (15564); Iroquois, abundant in muddy inlet (14639); Cardinal, shallowing lagoon (14915), shallow water, shore of St. Lawrence (14925); Tuttle Point, muddy shore (14858), shallow lagoon (15859). (Figure 47 shows habitat of specimen 14639.

Sagittaria latifolia Willd. Common; forming dense zones in shallow water and in muddy marshes along shore of the River and its inlets, and of streams inland; native. Variation in leaf morphology is of genetic rather than ecologic nature, since different forms occur side by side in same habitat. Coll.: Var. latifolia forma hastata (Pursh) Robins.: Robinson's Creek (7958); Sheek I. (7930A); Steen I. (15591); Cardinal (14900); Tuttle Point (14861). Forma gracilis (Pursh) Robins.: Sheek I. (7930B); Grassy I. (8010); Steen I. (15590); Morrisburg (15287); Tuttle Point (14863). Var. obtusa (Muhl.) Wieg.: Iroquois (14644, figure 48).

Sagittaria cuneata Sheldon Common; shallow water (where plants are sterile with basal linear rosette and long-petioled floating hastate blades) and wet mud (where blades are firm on erect petioles) of shore of St. Lawrence, inlets and streams; native. Coll.: Cornwall (1268); Steen I. (14544); Aultsville Station (14599); Morrisburg (15288); Iroquois (14638, 14818); Iroquois Point (14819); Tuttle Point (14857, 14862).



## BUTOMACEAE

Butomus umbellatus L. Common; abundant all along shore of the River in shallow water, but not forming extensive solid stands as on the flats near Montreal; not extending up tributaries beyond the dead-water at their mouths; adventive. Coll.: Steen I. (7724, 7946, 8249); Aultsville (14547); Cardinal (14911); Presqu'ile (8118, 8131); Tuttle Point (14853). (Figure 45)

## HYDROCHARITACEAE

Elodea canadensis Michx. Very common; generally forming dense pure beds in one to four feet of quiet or moving water sometimes reaching surface, in St. Lawrence, its inlets, and streams; leaves very congested on plants in dense beds but widely spread on the drawn-out stems, up to 4 feet long, in deeper fast water; no flowers present; native. Coll.: Cornwall I. (Victorin 56865); Sheek I. (8182, 8257A); Grassy I. (8009); Wales, Hoople Creek (8210); Steen I. (8252); Aultsville (15585); Iroquois (15433).

Vallisneria americana Michx. Very common; abundant and often the chief aquatic submerged in waters up to 10 feet deep, fast or quiet; loosely rooted in bottom, the long leaves almost clogging shallow channels; masses of shorn leaves and stems float in shipping channels; present in the inlets but not seen in streams; widespread native. Coll.: Robinson's Creek (7959); Sheek I. (8256A); Steen I. (15599); Aultsville (15569); Cardinal (14924); Prescott (14892).

## GRAMINEAE

Bromus ciliatus L. Scarce; thin woods and clearings; native. Coll.: Cornwall I., grazed woods (7993); Sheek I., riverbank, at lower end (8166). Obs.: no other stations.

Bromus inermis Leyss. Scarce; roadsides and railroad embankments; adventive, but not yet widespread in area. Obs.: Mille Roches, railroad (no collections.)

Festuca rubra L. Frequent; road and canal embankments; pastures; adventive. Coll.: Long Sault, sod on shore (15141). Obs.: Morrisburg, dominant in pasture on clay soil; Iroquois, canal bank.

Festuca elatior L. Frequent; meadows, canal bank and roadsides; adventive. Coll.: Sheek I., meadow (15104).

Glyceria borealis (Nash) Batch. Common but always in sparse stands, shallow water of inlets and creeks, along quiet stretches of St. Lawrence; native. Coll.: Steen I., shore (7733); Iroquois, abundant in creek (14635). Obs.: Aultsville Station, wet land; Morrisburg, creek; Crysler Farm, shore marsh.

Glyceria striata (Lam.) Hitchc. var. stricta (Scribn.) Fern. Common; shores of St. Lawrence, creek banks, wet meadows and wet woods; native. Coll.: 3 miles W of Cornwall, moist woods (7632); Long Sault, moist meadow (15123); Wales, along stream (7664). Obs.: Morrisburg, creek bank; Iroquois, wet woods.

Glyceria grandis S. Wats. Common; marshes along St. Lawrence, shores of inlets, creeks and lagoons; native. Coll.: Steen I., shore (7731); Long Sault, wet meadow (15124); Wales, along stream (7664). Obs.: Aultsville Station, wet land; Morrisburg, creek; Iroquois, lagoon marsh; Cardinal, wet meadow.

Poa annua L. Common; garden and dooryard weed, often abundant among debris on moist beaches of the River; adventive. Coll.: Steen I. (8437); Aultsville, garden (15625); Iroquois, beach (14803).

Poa pratensis L. Very common; probably the most abundant and ubiquitous grass, dominating pastures, roadsides, fields and embankments, and encroaching into woodland; adventive. Coll.: Sheek I. (8426, 15086); Wagner I. (8033); Wales (8417). Abnormal plants, infected with the nematode Anguina agrostis (det. A. D. Baker), were present in moist sod of a parking area along Long Sault rapids (15135). This condition, frequent in maritime Canada, has not previously been noted in Ontario.

Poa compressa L. Common; abundant on dry built-up banks of canals, roadsides and railroads, but also present on sandy beach lines and open sites elsewhere; adventive. Coll.: Sheek I., sandy shore (2419), steep riverbank (15085).

Poa palustris L. Common; moist meadows, shore marshes, wet beach - lines, banks of creeks and inlets; native. Coll.: Sheek I., shore

(14394); Wales, Hoople Creek (8202). Obs.: Steen I., wet opening in woods; Aultsville Station, wet land; Morrisburg, marsh, inlet-shore; Iroquois, beach.

Poa (near P. memorialis or P. glauca) A single large clump on overhanging sandy bank, Ault Park, Sheek I.; not seen elsewhere, adventive (15084).

Poa alsodes Gray Rare; swampy woods; native. Coll.: east of Wales, swampy ash woods (8377).

Dactylis glomerata L. Occasional; dry embankments; adventive. Obs.: 4 miles below Morrisburg, bank of highway; Iroquois, bank (no collections).

Eragrostis poaeoides Beauv. Common; abundant on railroad tracks, probably all along line; adventive. Coll.: Wales (8237); Aultsville Station (s.n.); Iroquois (15312). Obs.: Morrisburg, railroad.

Eragrostis pectinacea (Michx.) Nees Rare; waste land; adventive. Coll.: 3 miles above Morrisburg, coal dust on wharf (15423). Obs.: not seen on railroads or elsewhere.

Agropyron trachycaulum (Link) Malte var. novae-angliae (Scribn.) Fern. Rare; dry riverbank; native. Coll.: Sheek I., gravel bank to rapids (7629). Obs.: not seen elsewhere.

Agropyron repens (L.) Beauv. Very common; abundant on canal and road banks where chief component of the sod, also in old fields and elsewhere; adventive. Coll.: Morrisburg (15364); Iroquois (14805).

Lolium perenne L. Rare; waste places; adventive, probably not persisting. Coll.: 2 miles above Morrisburg, among rubbish on shore (15348). Obs.: not encountered elsewhere.

Hordeum jubatum L. Rare; waste places; adventive. Obs.: Iroquois, a single plant in weedy area at railroad station; not seen elsewhere (no collections). Abundant along roadsides and in wet pastures by Winchester and Vernon 20 miles to North (where possibly native).



Hordeum vulgare L. Frequent; cultivated cereal and waif along roadways; introduced and escaped. Coll. : below Prescott elevator; in debris on shore (14871).

Triticum aestivum L. Occasional; waif along railroads, etc.; adventive, not persisting. Coll. : Tuttle Point, along canal (14846); below Prescott grain elevator, sand beach (14872).

Elymus virginicus L. Scarce; low woods and marshy shores; native. Coll. : 2 miles NE of Wales, swampy woods (7764); 4 miles below Morrisburg, shore (15284). Obs. : not seen elsewhere; continuous stands as along Rideau and Ottawa Rivers to north are lacking.

Hystrix patula (L.) Moench Scarce; woods; native. Coll. : Wales, low woods (7755). Obs. : not noted elsewhere.

Sphenopholis intermedia (Rydb.) Rydb. Rare; wet banks; native. Coll. : Sheek I., dripping bank, Ault Park (14423). Obs. : Aultsville Station, wet sandy bank.

Avena fatua L. Scarce; weed on highway edge and beach; adventive. Coll. : Iroquois, highway (15317); below Prescott elevator, sand beach (14873B).

Avena sativa L. Common as cultivated cereal, scarce as waif along roads and shore; introduced and escaped, not persisting. Coll. : below Prescott elevator; sandy shore (14873A). Obs. : Morrisburg, railroad.

Danthonia spicata (L.) Beauv. Frequent; open banks, often abundant in old clearings; native but spreading to abandoned land. Coll. : Sheek I., grassy place (2392). Obs. : Mille Roches, dry railroad-side; Farran Point, sandy field; Aultsville Station, dominant in old sandy field; Toussaint I., gravel riverbank.

Sporobolus neglectus Nash Occasional; dry soil; native but spreading to waste places. Coll. : Iroquois, dry soil at canal locks (14844), thin soil at limestone quarry (14934); Toussaint I., dry bank of River (15395). Obs. : not seen elsewhere than in vicinity of Iroquois.

Calamagrostis canadensis (Michx.) Nutt. Common; characteristic of swampy meadows along the River and inland; native. Coll. : Sheek I. (7642, 8252); Grassy I. (8025). Obs. : several other stations.

Agrostis "alba L." Common; meadows and pastures, embankments, waste land; adventive. Coll.: Steen I. (15593); Morrisburg (15349).

Agrostis palustris Huds. Common; wet sod along River shore, swampy meadows and stream banks; adventive. Coll.: Cornwall, shoreline (15616); Sheek I., wet shore (14398); Wales, wet meadow (7779); Iroquois, festooning old canal walls, sterile (15428).

Agrostis scabra Willd. Scarce; barren soil; native. Obs.: Aultsville Station, old sandy field; no other sites (no collections).

Agrostis perennans (Walt.) Tuckerm. Rare; not present along river shore (as along Ottawa R.), but around habitations as if locally introduced; possibly native. Coll.: Steen I., in eave's drip of cottage (15633); Indian I., in ruin of out-house (15706).

Cinna arundinacea L. Rare; woods; native. Coll.: Wales, low woods (7752), woods (8235).

Phleum pratense L. Very common; meadows, roadsides, embankments; adventive. Coll.: Sheek I. (2340).

Alopecurus aequalis Sobol. Scarce; moist upper beach-line of River; native. Coll.: Steen I., shore (14573); Iroquois, trampled shore (14636).

Muhlenbergia mexicana Trin. Frequent; moist open shores of the River and adjoining streams, also wet woodland; native. Coll.: Sheek I., rocky shore (8064); Long Sault, moist shore (15492); Wales, woods (8240); Aultsville Station, streamside (14602); Indian I., wet woods (15684, 15694); Cardinal, beach (14926). Obs.: the awned form, about equally common along Ottawa River is absent.

Brachyelytrum erectum (Schreb.) Beauv. var. septentrionale Babel Rare; woods; native. Coll.: 3 miles W of Cornwall, moist sandy woods (14413).

Oryzopsis asperifolia Michx. Rare; sandy woods; native. Obs.: 3 miles W of Cornwall; moist sandy woods (no collections.).

Spartina pectinata Link Rare; shore of St. Lawrence; adventive from region upstream, apparently of recent arrival. Coll.: Steen I., single clump among shore rocks (15634); 3 miles below Prescott, on sandy shore, below elevator, a single patch of the type of plant found around L. St. Clair (14867). Obs.: no other sites.

Phalaris arundinacea L. Very common; dense and almost continuous stand along shore of St. Lawrence, extending from the beach up the banks and through marginal meadows; seldom found inland; adventive. Coll.: Sheek I., shore (2414, 8161, 15091); Steen I., shore (7719). Obs.: At many points, the only "inland" site being in wet land by Aultsville Station; not seen on Indian I.

Phalaris arundinacea L. forma variegata (Parnell) Druce Occasional; roadside ditches; introduced and escaped. Coll.: Wales, patch 50 feet long along roadside (7656). Obs.: Iroquois, ditch by railroad station.

Leersia oryzoides (L.) Sw. Common; lining streams, inlets and wet depressions, also along shores of the River; native. Coll.: 3 miles above Cornwall, river shore (15609); Robinson's Creek, creek bank (7956); Mille Roches, margin of stream (8093), wet meadow (8098); Aultsville Station, along stream (14612); 3 miles below Prescott, wet beach (14877). Obs. numerous intermediate stations; in 1954 (a wet season) no plants seen with extruded panicles, all being "forma inclusa".

Zizania aquatica L. var. angustifolia Hitchc. Scarce; thin stands in muddy inlets; probably planted. Coll.: Wales, Hoople Creek (8185); 2 miles west of Morrisburg, muddy inlet (14946). Obs.: also seen at mouth of Hoople Creek, but nowhere else in area. (Figure 43)  
(Z. aquatica var. interior Fassett occurs in South Nation River at Hainesville (7 miles north of St. Lawrence River), where undoubtedly planted (14650).)

Digitaria ischaemum (Schreb.) Muhl. Probably scarce; waste places; adventive. Coll.: Morrisburg, shore at highway culvert (15296). Obs.: on railroad at Morrisburg, but not seen elsewhere; not distributed along beach as it is along Ottawa River.

Digitaria sanguinalis (L.) Scop. Common; widespread weed in gardens and waste land; adventive. Coll.: Aultsville, garden weed (14569, 15621); Morrisburg, waste land by canal (15303).



Panicum flexile (Gatt.) Scribn. Scarce; confined to wet shores of the River; native. Coll.: opposite lower end of Barnhart I., disturbed soil on shore (15515); Sheek I., springy shore of old channel below dam (8178, 15503); Presqu'ile, beach (8147).

Panicum capillare L. Common; abundant along beaches of the River and adjoining water bodies, developing late in season; also a common weed of gardens, roadsides and waste places; native, spreading to disturbed habitats locally. Coll.: Cornwall, riverbank (7955); Mille Roches, churchyard (8089); Wales, bank of Hoople Creek (8206), woods (8221); Sheek I., shoreline (15502); Steen I., beach (8259); Iroquois, beach (14791); Iroquois Point, beach (14827); Cardinal, beach (14919), roadside (14628B); Prescott, shore (14875).

Panicum tuckermanii Fern. Frequent; rather continuous along wet sandy beaches of the River, developing late in season and easily confused with P. capillare; native, not spreading as a weed. Coll.: Steen I., shore (8264); Iroquois, beach-line (14792, 14806); Iroquois Point, sand beach (14828B). Obs.: on floating logs in lagoon at mouth of Nash Creek.

Panicum virgatum L. Rare; railroad embankment; adventive. Coll.: Farran Point, a single large clone west of railroad station, established apparently many years ago, from West (15662).

Panicum linearifolium Scribn. var. weneri (Scribn.) Fern. Rare; sand ballast; adventive. Coll.: Mille Roches, a few tufts established on sand piled along railroad (15176).

Panicum lanuginosum Ell. Frequent; sandy land; native. Coll.: Cornwall, sandy meadow (14447); Sheek I., springy shore-meadow (15501); Farran Point, sandy pasture (7848).

Pennisetum setaceum (Forsk.) Chiov. Frequent; ornamental beds by canal locks (Morrisburg); introduced, not escaping.

Echinochloa crusgalli (L.) Beauv. Common; weed in gardens, roadsides, waste places and along shores; adventive. Coll.: Aultsville, garden (15622), shore (15581); Morrisburg, shore by highway culvert (15284), waste land (15282); Iroquois, beach (14807); Prescott, beach debris (14884, 14885).

Echinochloa pungens (Poir.) Rydb. var. pungens. Rare; creek banks; native. Coll.: Wales, bank of Hoople Creek (8203).

E. pungens var. wiegandii Fassett Frequent; shores of creeks and inlets rather than the River; native. Coll.: Wales, bank of Hoople Creek (8217); Morrisburg, shore of inlet (15295); Iroquois, inlet (14634).

E. pungens var. microstachya (Wieg.) Fern. & Grisc. Common; along shore of the River, spreading to moist waste places adjoining; native, but spreading as a weed. Coll.: Cornwall, shore (15600); Robinson's Creek, weed on fill (7950); Steen I., beach (8263); Iroquois, highway shoulder by shore (14945); Presqu'ile, shoreline (8111, 8143).

Setaria glauca (L.) Beauv. Common weed; adventive. Coll.: Wales, bank of Hoople Creek (8187); Prescott, beach (14887).

Setaria viridis (L.) Beauv. Common weed; adventive. Coll.: Iroquois, highway (14628).

(Setaria verticillata (L.) Beauv. Weed in hotel yard at Prescott (14881).)

Miscanthus sacchariflorus (Maxim.) Hack. Rare; escaped from cultivation and persisting; introduced. Coll.: west of Aultsville, single patch in ditch (15571). Obs.: known elsewhere in Ontario only from Aurora.

Andropogon gerardii Vitman Rare; steep dry riverbank; native, also introduced along railroad embankment. Coll.: opposite lower end of Barnhart I., large stand on steep west-facing bank of River (15513, 15514); Farran Point, single clump along railroad (15660); Wales, single plant on railroad shoulder (14436).

#### CYPERACEAE

Cyperus rivularis Kunth Common; wet sand beaches all along St. Lawrence; native. Coll.: Sheek I., shore (8075); Mille Roches, mud along stream (8097); Steen I., beach (8262, 14574); Iroquois Point, wet sand beach (14826); Presqu'ile, beach (8146); Cardinal, wet sand beach (14923).

Cyperus engelmannii Steud. Rare; sand beach; adventive. Coll.: below Prescott grain elevator where possibly a waif from West (14869).

Cyperus esculentus L. Rare; arable moist land; adventive. Coll.: Morrisburg, garden (Shumovich 1475); bad weed in moist fields at Hainesville, a few miles north of study area (14653).

Cyperus strigosus L. Common; sandy moist beaches of St. Lawrence, only sparingly inland; native. Coll.: Sheek I., river shore (8067, 8183, 14401); Long Sault, gravel beach (15490); Steen I., river shore (7738), spring margin (7947); Aultsville Station, old sandy field (7871); Morrisburg, shore (15350); Iroquois, beach (14809); Iroquois Point, beach (14832); Toussaint I., shoreline (15389); above Iroquois, beach (15381); Cardinal, shoreline (8119).

Dulichium arundinaceum (L.) Britt. Rare; shore of St. Lawrence only; native. Coll.: Grassy I., shallow water (8017).

Eleocharis acicularis (L.) R. & S. Very common; forming dense mats on wet beaches or under a few inches of water, muddy edges of creeks; native. Coll.: Sheek I., shore (8069); Steen I., flood-beach (14568); Iroquois, mud along creek (14646), beach of St. Lawrence (14802); Iroquois Point, wet sand beach (14830X); Toussaint I., sand beach (15387); Cardinal, shoreline (8109).

Eleocharis obtusa (Willd.) Schultes Occasional; bare wet mud in pastures, meadows and swamps; not along shores; native. Coll.: 3 miles W of Cornwall, wet ground (7667), open soil in marsh (7695); Aultsville Station, wet field (7875).

Eleocharis smallii Britt. Common; characteristic of shoreline marshes often forming beds in about one foot of water; native. Coll.: Grassy I., shore marsh (8020); Aultsville, shallow water (15570); 4 miles below Morrisburg, shallow water (15291); Morrisburg, marshy inlet (s.n.); Cardinal, marsh (14907B). Obs.: not seen in creeks or marshes away from River.

Eleocharis calva Torr. Common; forming sod on shoreline of St. Lawrence; native. Coll.: Sheek I., shore (8183), muddy shore (8067), wet sandy shoreline (14401); Steen I., shore (7738), spring



margin (7947); Iroquois Point, beach (14832); Cardinal, shoreline (8119).

Eleocharis compressa Sulliv. Scarce; wet shoreline of St. Lawrence; native. Coll.: Sheek I., shoreline with E. calva (14400, figure 33).

Scirpus smithii Gray Rare; sand beach of St. Lawrence; native. Coll.: Iroquois Point, beach (14829). Obs.: no other records; known from L. Ontario and the estuary near Quebec City.

Scirpus americanus Pers. Frequent; shallow water along St. Lawrence; native. Coll.: Sheek I., shore meadow (7653), shallow water (9065); Iroquois Point, shoreline (14840).

Scirpus validus Vahl Very common; forming extensive pure zones in water off-shore, or mixed with Typha and other marsh species; native. Coll.: Grassy I., shallow water (8024); Wales, bank of Hoople Creek (8208); Steen I., River shore (7726), bed in River (15589); Aultsville, off-shore beds (15681); Presqu'ile, shoreline (8123).

Scirpus acutus Muhl. forma congestus (Farw.) Fern. Scarce; shoreline marshes; native. Coll.: 4 miles below Morrisburg, marsh (15292).

Scirpus fluviatilis (Torr.) Gray Very common; in dense stands or mixed with Typha in shallow water of shoreline marshes, frequently not flowering; native. Coll.: 4 miles below Morrisburg, Typha marsh (15290). Obs.: at many stations, all along the River.

Scirpus rubrotinctus Fern. Rare; shoreline meadow; native. Obs.: Long Sault, a single patch on shore of St. Lawrence (no collection).

Scirpus atrovirens Willd. Very common; sedge meadows, near and back from the River; native. Coll.: 3 miles W of Cornwall, marshy clearing (7693); Sheek I., sedge meadow (7653), shore marsh (7918); Wales, along Hoople Creek (8205, 8209); Farran Point, willow swamp (7851); Presqu'ile, beach (8141).

Scirpus cyperinus (L.) Kunth Frequent; sedge-meadows mainly away from shoreline; native. Coll.: Steen I., wet clearing (14563).

Cladium mariscoides (Muhl.) Torr. Rare; shore of St. Lawrence only; native. Coll.: lower end of Sheek I. (8165).

Carex rosea Schk. Frequent; woods; native. Coll.: Sheek I., maple-beech woods (7614); Long Sault, low woods (15107); Wales, ash woods (7768).

Carex vulpinoidea Michx. Common; wet meadows, ditches and stream banks; native. Coll.: Sheek I., riverbank (7628); Wales, bank of Hoople Creek (8186), meadow (7665). Obs.: numerous stations, both near and back from the River.

Carex trisperma Dewey Woods; native. Coll.: 3 miles W of Cornwall, moist sandy woods (7633).

Carex scoparia Schk. Common; swampy depressions in pastures and clearings; native. Coll.: 3 miles west of Cornwall, marshy clearing (7681, 7689).

Carex deweyana Schw. Scarce; rich woodlands; native. Coll.: Steen I., woodland (14554).

Carex (? tribuloides Wahl.) Rare; deep woods; native. Coll.: Indian I., moist woods (15688).

Carex projecta Mack. Common; moist sandy woods; native. Coll.: 3 miles W of Cornwall, wet sandy woods (7672, 7679); Steen I., maple woods (7709); 2 miles NE of Wales, swampy woods (7751).

Carex tenera Dewey. Frequent; dry rich woods; native. Coll.: Steen I., maple woods (7709x).

Carex pensylvanica Lam. Common; forming pale green mats on dry sandy land, often sterile; native. Coll.: Sheek I., top of sandy bank (14426, 15100). Obs.: 3 miles W of Cornwall, sandy woods; Wales, woods; Steen I., dry woods.

Carex granularis Muhl. Common; moist meadows along the River and elsewhere; native. Coll.: Sheek I., shore (15099); Aultsville Station, wet sandy land (7873); Wales, wet meadow (7778).

Carex gracillima Schw. Common; woodland; native. Coll.: 3 miles W of Cornwall, marshy woods (7691); Mille Roches, sandy woods (15159); Steen I., maple woods (7712B); Wales, low woods (7757).

Carex arctata Boott. Woods; native. Coll.: Steen I., maple woods (7712A).

Carex debilis Michx. var. rudgei Bailey Woods; native. Coll.: 3 miles W of Cornwall, moist sandy woods (7636).

Carex viridula Michx. Frequent; characteristic of wet sandy shores of the River, not present inland; native. Coll.: Sheek I., shore (8076), marshy shore (14399); Steen I., shore (7728); Presqu'ile, muck swamp (8126, 8155).

Carex pallescens L. var. neogaea Fern. Scarce; wet meadows; native. Coll.: Steen I., shore of River (7736).

Carex lasiocarpa Ehrh. var. americana Fern. Common; chief constituent of some wet meadows along the River, not often flowering; native. Coll.: Long Sault, shore-meadow (15130).

Carex scabrata Schw. Rare; springy banks; native. Coll.: Steen I., spring on bank of River (7623).

Carex stricta Lam. Frequent; forming tussocks in wet meadows; native. Coll.: Sheek I., springy bank (7644), shore-meadow (7651); Long Sault, wet beach-line (15131).

Carex crinita Lam. var. crinita. Common; characteristic of marshy clearings; native. Coll.: 3 miles W of Cornwall, tussocky marsh (7685).

Carex hystericina Muhl. Common; wet meadows along River shore and inland in low areas; native. Coll.: Sheek I., shore meadow (7625); Long Sault, shore (15121); Wales, wet meadow (7775); Steen I., beach (7728).

Carex lacustris Willd. Scarce; springy meadows; native. Coll.: Sheek I., in spring on slope to River (7643).



Carex retrorsa Schw. Frequent; swamps and creek-banks; native.  
Coll.: Wales, swampy woods (7792), bank of Hoople Creek (8196).  
Obs.: creek-bank swamp back of Morrisburg; not present along the River.

Carex rostrata Stokes Scarce; marshes; native. Coll.: Grassy I., marsh (8018).

Carex intumescens Rudge Occasional; woods; native. Obs.: Mille Roches, wet woods (no collections).

Carex lupulina Muhl. Common; wet woods, ditches, marshy depressions in pastures; native. Coll.: Wales, ditch (7666), wet woods (7770, 8241); Aultsville Station, pasture marsh (14598).

#### ARACEAE

Arisaema triphyllum (Ait.) Blume Frequent; moist woods; native.  
Coll.: 3 miles W of Cornwall (8342); Sheek I. (8447); Wales (8372, 14434); Steen I. (7703).

Symplocarpus foetidus (L.) Nutt. Rare; oozy muck in woods; native.  
Coll.: 3 miles W of Cornwall, head of Robinson's Creek (7973, 8347, 14446); Sheek I., along spring in woods (8433). Obs.: on Cornwall I., but at no other sites. (Figure 36)

Acorus calamus L. Common; marshes along St. Lawrence; native.  
Coll.: Sheek I., shallow water (7922, 8068); Grassy I., swamp (8016); Presqu'ile, boggy swamp (8132).

#### LEMNACEAE

Spirodela polyrhiza (L.) Schleid. Common; floating on quiet waters, always with Lemna minor; native. Coll.: Iroquois, inlet (14641, 14642); Cardinal, cat-tail swamp (14903).

Lemna trisulca L. Very common; submerged in quiet waters one to three feet deep and tangled among other aquatics or, in late season, forming thick billow-like beds just beneath the surface; native.  
Coll.: Aultsville (7607, 15566, 15680); Iroquois (14632); Cardinal (14899).

Lemna minor L. Very common; floating on water, sometimes in pure solid mass; native. Coll.: as for Spirodela, and Sheek I. (7923); Wales (8369).

Wolffia columbiana Karst. Rare; forming thick masses in surface waters of lagoon; probably locally adventive. Coll.: 1 mile E of Morrisburg, lagoon at mouth of Nash (Hosaic) Creek (8278, figure 53).

#### PONTEDERIACEAE

(Pontederia cordata L. Present in South Nation drainage at Hainesville, a few miles to north (14654); not in study area.)

Heteranthera dubia (Jacq.) MacM. Very common; abundant in St. Lawrence and mouths of its tributaries, in quiet or rapid waters; in disused canals forming dense beds sometimes reaching surface in 6 feet of water, rarely flowering; native. Coll.: Sheek I., shallow water (8071); Iroquois, shallow water of River (14817), plants 8 feet long in canal (15427), thick masses in old canal (15432); Cardinal, swift water (8116); Prescott, shallow water of sand beach (14893).

#### JUNCACEAE

Juncus bufonius L. Common; abundant on bare wet soil in fields and on beaches; native, spreading as a weed. Coll.: 3 miles W of Cornwall, open soil of marsh (7694); Iroquois, wet sand beach (14804, 14818); Tuttle Point, shore (14854).

Juncus tenuis Willd. Common; in wet sod on shoreline of River or in moist trodden places; native, spreading locally as a weed. Coll.: Sheek I., shore (7627); Wales, at gravel pit (7798B); Aultsville Station, moist sandy field (7876).

Juncus dudleyi Wieg. Common; more abundant than J. tenuis, often growing together; along shores and in wet meadows; native, spreading as a weed. Coll.: Wales, wet meadows (7777, 7782), bank of Hoople Creek (8190); Steen I., riverbank (7714); Iroquois Point, sand beach (14830); Presqu'ile, beach (8137, 8138).

Juncus effusus L. Frequent; abundant in swampy meadows; native. Coll.: Aultsville Station, swamp (14610).

Juncus nodosus L. Common; abundant on wet sandy beaches of the River and in wet meadows; native. Coll.: 3 miles W of Cornwall, low ground (7668); Sheek I., River shore (8181, 8258A); Wales, wet meadow (7776); Steen I., shore (7737); Iroquois Point, beach (14831); Presqu'ile, swamp (8153).

Juncus torreyi Cov. Rare; springy River shore; native. Coll.: 3 miles above Cornwall, wet slipping sod on bank of River (15608).

Juncus brevicaudatus (Engelm.) Fern. Common; along shore of River in wet meadows and pastures; native. Coll.: Wales, woods (8238); Farran Point, sandy pasture (7849); Aultsville Station, wet sandy land (7872); Presqu'ile, swamp (8127, 8151, 8152).

Juncus alpinus Vill. Common; wet sand beaches or grassy shores of the River mainly, wet places inland; native. Coll.: 3 miles W of Cornwall, springy shoreline (15613); Sheek I., shore (8260A, 14402); Wales, wet meadow (7781); Steen I., beach (7729, 7835, 15659), shore (7735); Iroquois, wet sod of beach (15383); Toussaint I., moist beach (15399); Presqu'ile, beach (8145).

#### LILIACEAE

Uvularia grandiflora Sm. Scarce; moist woods; native. Coll.: Long Sault, low woods on shore (15113); Wales, ash woods (8384). Obs.: not seen elsewhere; not on islands.

Uvularia sessilifolia L. Rare; moist sandy woods; native. Coll.: 3 miles W of Cornwall, abundant in woods (7635, 14419). Obs.: no other stations.

Hemerocallis fulva L. Frequently escaped to roadsides and dumps along shore of St. Lawrence; introduced. Obs.: 4 miles below Morrisburg, ditch; 2 miles above Morrisburg, inlet bank; 2 miles above Iroquois, shore (no collections).

Erythronium americanum Ker Occasional; woods; native. Obs.: 3 miles W of Cornwall, pine-maple woods; Wales, woods (no collections).

Asparagus officinalis L. Sometimes escaped from cultivation or persisting in abandoned gardens; introduced. Obs.: Steen I., field margin.



Clintonia borealis (Ait.) Raf. Occasional; moist woods; native.  
Coll.: 3 miles W of Cornwall, white pine-red maple woods on sand (7631); Wales, deep woods (8457). Obs.: not seen on islands in the River.

Smilacina racemosa (L.) Desf. Common; woods; native. Coll.: 3 miles W of Cornwall, rich woods (8334); Sheek I., wooded slope to River (8394); Long Sault, low woods (15129, 15487); Wales, low woods (7767); Indian I., sandy woods (15703).

Smilacina stellata (L.) Desf. Scarce; wet woods; native. Coll.: Iroquois, elm woods (8412).

Maianthemum canadense Desf. Common; woods; native.  
Coll.: 3 miles W of Cornwall, sandy woods (7630); Sheek I., dry woods (8451), abundant under pine and beech (14424), maple bush (2390), sandy soil under Thuja (15103). Obs.: Mille Roches, common in wet woods; Wales, abundant in woods; Farran Point, dry woods; Steen I., dry woods; Aultsville Station, sandy woods; Indian I., sandy woods.

Streptopus roseus Michx. var. perspectus Fassett Scarce; rich woods; native. Coll.: 3 miles W of Cornwall, clearing in woods (8333).

Polygonatum pubescens (Willd.) Pursh Frequent; woods; native.  
Coll.: 3 miles W of Cornwall, deciduous woods (8351); Sheek I., springy wooded slope (7645); Long Sault, low woods (15136).  
Obs.: Steen I., maple woods.

Convallaria majalis L. Sometimes persisting at sites of old gardens; introduced and escaping. Obs.: Steen I., persisting from old planting.

Medeola virginiana L. Scarce; woods; native. Coll.: 3 miles W of Cornwall, white pine-red maple woods (7634, 15154), beech woods (7970). Obs.: Wales, beech-sugar maple woods; not seen elsewhere.

Trillium erectum L. Occasional; moist woods; native. Coll. 3 miles W of Cornwall, rich woods (8341); Wales, low woods (7788). Obs.: Sheek I., woods.

Trillium grandiflorum (Michx.) Salisb. Frequent; rich woods; native. Coll.: 3 miles W of Cornwall, hardwoods (8339); Sheek I., maple-beech woods (8446); Long Sault, low woods (15137); Steen I., rich sugar maple woods (7705, 14558).

Trillium undulatum Willd. Scarce; sandy woods; native. Coll.: 3 miles W of Cornwall, wet sandy woods (7674), clearing in woods (8335); Wales, deep wet woods (8459).

Smilax herbacea L. Common; woods and thickets; native. Coll.: Mille Roches, fencerow by stream (8092), sandy woods (15157); Steen I., maple woods (7710), thicket (14584); Wales, low woods (7790). Obs.: near Cornwall, sandy woods; Long Sault, wet woods; Indian I., sandy woods.

#### IRIDACEAE

Sisyrinchium montanum Greene Common and widespread; wet grassy shorelines and meadows; native. Coll.: Cornwall, 3 miles W, marsh (7690); Sheek I., grassy area (2374), moist shoreline (15101); midway Wales to Moulinette, field (8419).

Iris versicolor L. Common; marshes, stream and pond margins; native. Coll.: Long Sault, shore-marsh (15134); Wales, streambank meadow (7660).

#### ORCHIDACEAE

Orchis spectabilis L. Rare; woods; native. Coll.: 1 mile E of Wales, dry deciduous woods (8466).

Habenaria hyperborea (L.) R. Br. Scarce; wet meadows; native. Coll.: Iroquois, marshy meadow along lagoon of River (15378).

Habenaria psycodes (L.) Spreng. Frequent; moist open woods and clearings; native. Coll.: 3 miles W of Cornwall, swamp in woods (7977); 2 miles NE of Wales, swampy woods (7795); Farran Point, damp woods (7861).

Epipactis helleborine (L.) Crantz Occasional; abundant at a few stations in rich woods; adventive. Coll.: Long Sault, wet woods (15485);

Indian I. , moist woods (15692). These records fulfil predictions of recent authors of its occurrence (Montgomery, Rhodora 50:236-238, 1948; Soper & Garay, Fred. Ont. Nat. Bul. 65:4-7, 1954).

Spiranthes romanzoffiana Cham. Scarce; springy shore; native.  
Coll. : Sheek I. , lower end, mossy flat (7934).

(Liparis loeselii (L.) Richard Muck swamp, 1 mile N of Morrisburg; not found in area to be flooded.)

#### SALICACEAE

Populus tremuloides Michx. Frequent; steep banks and rocky shores , widespread in sandy wet land; native. Coll. : Sheek I. , rocky shore (2423), steep bank to rapids (15096).

Populus grandidentata Michx. Occasional; rocky and sandy shores and woods; native. Coll. : Sheek I. , rocky shore (2425), open riverbank (8399), high bank at Rapids (15088); Indian I. , sandy part of island (15699).

Populus alba L. Scarce; large trees, sometimes surrounded by sucker colonies; introduced. Coll. : one mile E of Aultsville, highway park along canal (15477).

Populus nigra L. var italica DuRoi Frequently planted along shoreline properties and canals; introduced. Obs. : one mile E of Aultsville (see figure 6).

Populus canadensis Moench Rare; cultivated; introduced. Coll. : Mille Roches, row of trees near church (8091). Obs. : no other record.

Populus balsamifera L. Frequent; river shores, canal banks and wet land, forming groves; native. Coll. : Long Sault, wet land, forming groves (15133); Steen I. , river shore (15640, 15638). Obs. : seen on several occasions. (Figure 30)

Salix fragilis L. Common, sandy and rocky shores, wet clay banks; adventive, spreading by vegetative fragments. Coll. : Sheek I. , pebble shore (7612, 8251, 15092); Long Sault, shore (15132); Hoople Creek, clay bank (8189, 8215). Wagners I. , sandy-gravel shore (8034); Steen I. , open river bank (7716, 15652); Morrisburg, 1 mile E (8282); Iroquois, 2 miles E, rocky shore (14629); Prescott, 3 miles E, sandy



shore (14879). Obs.: almost continuous distribution along the St. Lawrence shores, propagating from broken branches; seldom up the tributary streams.

Salix rigida Muhl. Probably scarce; river shores; native. Coll.: Sheek I., shallow mud over limestone, river shore (8169).

Salix bebbiana Sarg. Common; river shores, clay banks, open meadows and wet fields; native. Coll.: Sheek I., dry rivershore (8250, 15098), base of clay bank (8428); Wales, 3 miles E, open field (8226, 8390, 8381).

Salix discolor Muhl. Occasional; river shores, low woods; native. Coll.: Sheek I., rivershore on limestone (8170, 8175); Wales, mixed woods (8223). Obs.: numerous stations.

Salix gracilis Anderss. Common; river shores, low woods, open fields; native. Coll.: Robinson's Creek, clearing (8359); Sheek I., mud over limestone, shore (8162); Wales, open field (8382), clearing in elm-ash woods (8239); Iroquois, along railway (8406); Farran Point, low woods (7839).

#### JUGLANDACEAE

Juglans cinerea L. Occasional; well-drained deciduous woods and clearings; native. Coll.: Wales, common tree (14431). Obs.: Sheek I.; morainic ridge west of Moulinette.

Juglans nigra L. Rare; introduced. Coll.: 2 miles W of Cardinal, a single large tree along abandoned roadway (14933, figure 3). Obs.: no other sites.

Carya cordiformis (Wang) K. Koch Scarce; dry soils; native. Coll.: Moulinette, dry morainic slope (15529); Steen I. (14589). Obs.: no other sites.

Carya ovata (Mill.) K. Koch Frequent; dry woods on islands and near shore of St. Lawrence only; native. Coll.: Sheek I., large tree (7608); Wagners I., open pasture, large tree (8030); Indian I., sandy ridge (15698); Iroquois, lining cut-bank in pasture (14649, figures 23 and 24). Obs.: also seen on high bank of River 2 miles W of Cornwall, on

Toussaint Island, at Iroquois Point and elsewhere; often in pastures or by farmhouses where it seems to have been left for its nuts, which are produced in quantity: not seen inland more than mile north of the River.

### CORYLACEAE

Corylus americana Walt. Scarce; moist sandy woods and clearings; abundant between Cornwall and Mille Roches; native, at limit of range; fruiting abundantly. Coll.: Cornwall I., grown-over pasture (7988); 3 miles W of Cornwall, moist sandy woods (7954, 14417), old clearing (15149); Long Sault, low woods (15126); Mille Roches, reverting pasture land (15173); Iroquois, wet woods (14942).

Corylus cornuta Marsh. Common; woods and thickets; native. Coll.: 3 miles W of Cornwall, moist sandy woods (14418); Sheek I., rocky riverbank (7622), dry woods (14411); Steen I., border of woods (15644); Indian I., dry woods (15707).

Ostrya virginiana (Mill.) K. Koch Common; woods or clearings; native. Coll.: Steen I., bank of River (14579). Obs.: at most sites, as: near Cornwall, near Mille Roches, Sheek I., Aultsville Station, Indian I., Iroquois Point; not often fruiting.

Carpinus caroliniana Walt. var. virginiana (Marsh.) Fern. Frequent; woods and clearings; native. Coll.: 3 miles W of Cornwall, edge of woods (14445), creek bank (7960); Long Sault, moist woodland (15105); Steen I., border of woods (14623).

Betula lutea Michx. f. Common; woods and clearings; native. Coll.: Mille Roches, sandy woodland (15161); Sheek I., riverbank (14429, 14430). Obs.: at several places, as: Moulinette, Wales, Aultsville Station.

Betula populifolia Marsh. Common; chief component of second-growth woods on wet sandy land back from River; probably native, but spreading rapidly, apparently from the east. Coll.: Mille Roches, taking over old clearing on moist sandy land (15162); Farran Point, dominant, low woods (7840); Aultsville Station, invading moist sandy pasture (14611). Obs.: beyond area, seen: 3 miles S of Morewood, 2 miles S of South Mountain, and N of Prescott; not continuous across terrain to Ottawa.

Betula papyrifera Marsh. Common; woods and clearings; native. Coll.: 3 miles W of Cornwall, beech woods (7982); Sheek I., rocky shore (2422, 15102); Steen I., second-growth woods (14560).

Alnus rugosa (DuRoi) Spreng. Common; riverbank thickets and wet land; native. Coll.: Sheek I., riverbank (2431, 7650, 14428); Long Sault, shore (15127).

#### FAGACEAE

Fagus grandifolia Ehrh. Common; original component of dry woods, also widespread as small second-growth tree; native. Coll.: Sheek I., large trees on dry bank (2435, 14421). Obs.: in most woodlands.

Quercus alba L. Frequent; large trees on crest of banks of River (not fruiting); native. Coll.: Sheek I. (2436); Steen I. (14587). Obs.: in woods 3 miles west of Cornwall; not seen "inland".

Quercus macrocarpa Michx. Common; large trees on high riverbanks, in second-growth woods on moist sandy land, and along fencerows; native. Coll.: Mille Roches (15167).

Quercus rubra L. Frequent; large trees on high banks of River, and in woods "inland"; native. Coll.: Sheek I., hillside (2371); Wagners I., top of steep shore (8039); Steen I., edge of under-cut riverbank (15635); Indian I., shore bank (15697). All are probably var. rubra.

#### ULMACEAE

Ulmus rubra Muhl. Scarce; dry woods; native. Coll.: Toussaint I., solitary large tree in "parkland" mainly of U. americana (15402, figure 17). Obs.: W of Moulinette, a single tree on gravel ridge; 3 miles W of Morrisburg.

Ulmus americana L. Very common; the chief component of wet woods; also along fields fencerows and riverbanks; native. Coll.: Long Sault, shoreline (15489).

Ulmus thomasi Sarg. Rare; dry morainic woods; native. Coll.: 2 miles W of Moulinette, rocky moraine (15526, figure 21). Obs.: not seen elsewhere.

(Celtis occidentalis is mapped at about the position of Morrisburg by Raymond (Montreal Bot. Gard. Mem. 5:101, 1950); not seen during survey.)



CANNABINACEAE

Humulus (sp. ?) Scarce; fencerow; introduced. Obs.: on fence along canal, 1 mile W of Cornwall (no collections).

URTICACEAE

Urtica gracilis Ait. Common; forming large dense patches 5 to 7 feet tall in shorebank thickets and around trampled stockyards; native. Coll.: Steen I., thicket (14551); 3 miles W of Aultsville, moist land on shore (15576).

Laportea canadensis (L.) Wedd. Frequent; characteristic of deep moist woods; native. Coll.: 3 miles W of Cornwall (7979); Wales (7748, 8230, figure 22).

Pilea pumila (L.) Gray Common; wet places in woods, spreading to wet disturbed habitats; native. Coll.: Cornwall I., woods (7998); 3 miles W of Cornwall, swampy woods (7974); Wales, bank of Hoople Creek (8218), elm-ash woods (8233); Iroquois, wet woods (14936).

Boehmeria cylindrica (L.) Sw. Frequent; deep wet woods; native. Coll.: 3 miles W of Cornwall, low woods (7971); Wales, swampy woods (7745, 7763, 8234).

SANTALACEAE

Comandra richardsiana Fern. Scarce; moist sandy land; native. Coll.: 2 miles W of Cornwall, sandy clearing (15151); Sheek I., clearing (8445). Obs.: Steen I., clearing.

ARISTOLOCHIACEAE

Asarum canadense L. Scarce; woods; native. Coll.: Long Sault, low woods (15119); Wales, woods (8227). Obs.: not seen elsewhere.

POLYGONACEAE

Rumex crispus L. Common; weed in moist fields and ditches, also on beaches of River; adventive. Coll.: Sheek I., field (8055), open slope

(7624), grassy area (2355); Steen I., sandy shoreline (8260); Iroquois, upper beachline (14797); Prescott, sand beach (14891).

Rumex orbiculatus Gray Frequent; streambanks and wet soil; native. Coll.: Mille Roches, stream (8082); Iroquois, ditch in woods (14940), wet woods (14939); Presqu'ile, swamp (8158).

Rumex acetosella L. Frequent; weed on poor soils; adventive. Coll.: Sheek I. (2333).

Polygonum achoreum Blake Common; dense stands along roadways; adventive, reputed to be native but not found in natural habitats. Coll.: Morrisburg, roadside (15280).

Polygonum aviculare L. Common; dooryard and roadside weed, also on beach of River; adventive. Coll.: Steen I., sandy beach (8256); Morrisburg, edge of road (15281); Iroquois Point, shore (14836); Presqu'ile, gravelly beach (8143).

Polygonum coccineum Muhl. Frequent; in water or marshes near the River only; native. Coll.: Tuttle Point, thicket along lagoon (14848); Prescott, beach (14886). Obs.: Morrisburg, mouth of Nash Creek.

Polygonum amphibium L. Scarce; in water or swamps; native. Coll.: Grassy I., swamp (8012).

Polygonum pensylvanicum L. Occasional; weed in wet places; native. Coll.: Sheek I., river shore (8080); Aultsville Station, marsh in pasture (14593). Obs.: Iroquois, along railroad.

Polygonum lapathifolium L. Common; weed along beaches of the River; possibly native. Coll.: Sheek I., river shore; Steen I., weed on beach (14576); Iroquois, beachline (14794A, 14794B); Iroquois Point, sandy beach (14821, 14822); Cardinal, shoreline (8115); Prescott, sandy shore (14876).

Polygonum hydropiper L. Very common; wet spots in pastures, along shores of creeks and the River, in ditches and elsewhere in moist bare soil; reputed native but apparently adventive locally. Coll.: Cornwall I., woods (8003); Sheek I., shore (2413, 8066); Wales, hillside (7805), bank of Hoople Creek (8197, 8201); Steen I., cut-bank of River (14622);

Aultsville Station, sandy field (7874); Cardinal, abundant on sandy beach (14905, 14922), pastured shoreline (8122); Presqu'ile, swamp (8135).

Polygonum persicaria L. Common; weed along beaches of the River and in bare soil; adventive. Coll.: Sheek I., springy riverbank (7948); Steen I., weed along beach (14575); Cardinal, sand beach (14917).

Polygonum punctatum Ell. Rare; shore of River; native. Coll.: near Cardinal, shore of St. Lawrence (14906).

Polygonum sagittatum L. Scarce; wet meadows and pastures; native. Coll.: Aultsville Station, moist pasture (14592). Obs.: Iroquois, along creek in pasture.

Polygonum convolvulus L. Common; weed in waste places; adventive. Coll.: Sheek I., bush (2389); Iroquois, highway bank (14627); Prescott, sandy shore (14866). Obs.: at several points on railroad cinders.

Polygonum scandens L. Rare; in herbaceous thicket on shore of River; native. Coll.: Steen I., solitary plant on beach (15595).

Polygonum cuspidatum Sieb. & Zucc. Commonly escaped or persisting from cultivation; introduced. Coll.: Aultsville, fence-row (15605); Morrisburg, waste land on waterfront (15279, Shumovich 1477).

Fagopyrum sagittatum Gilib. Cultivated or scattered as a weed; introduced. Coll.: Morrisburg, highway bank (15299).

#### CHENOPODIACEAE

Chenopodium album L. Common; weed in waste places, often abundant on moist sandy beaches; adventive. Coll.: Mille Roches, churchyard (8088); Sheek I., maple bush (2388); Steen I., clay cut-bank (14621); Iroquois Point, sand beach (14834); Prescott, upper sandy shore (14868).

Chenopodium glaucum L. Common; weed in waste places, often abundant on moist sandy beaches; adventive. Coll.: Iroquois, river shore (14813), railroad ballast (15311); Iroquois Point, sand beach (14833); Cardinal, shoreline (8113), sand beach (14916).

Chenopodium capitatum (L.) Aschers. Rare; clearings; native. Coll.: Wales, gravel pit in woods (7740).



Atriplex patula L. var. hastata (L.) Gray Common; weed of waste ground, often along beach of River; native. Coll.: Aultsville, garden on river's edge (8275); Presqu'ile, gravelly beach (8148); Prescott, sandy shore (14883).

Atriplex patula var. littoralis (L.) Gray Scarce; shore of River; native. Coll.: Iroquois, upper beach (14796).

Salsola kali L. Frequent; weed in bare soil; adventive. Coll.: Farran Point, railroad (15669); Prescott, waif on beach from grain elevator (14880). Obs.: along railroad at Morrisburg and Iroquois.

#### AMARANTHACEAE

Amaranthus retroflexus L. Common; weed in waste places and along shores; adventive. Coll.: Mille Roches, yard (8084); Iroquois, beach (14812); Cardinal, sandy shore (14920).

Acnida (? altissima Riddell) Rare; sporadic as weed; adventive. Coll.: Farran Point, a single, staminate plant on railroad (15670).

#### NYCTAGINACEAE

Mirabilis nyctaginea (Michx.) MacM. Rare; weed in waste ground; adventive. Coll.: Iroquois; railroad ballast (15308).

Mirabilis hirsuta (Pursh) MacM. Prescott, railroad cinders (Montgomery 1026).

#### PORTULACACEAE

Claytonia caroliniana Michx. Probably frequent; woods; native. Coll.: 3 miles W of Cornwall, patches in woods (8356).

#### CARYOPHYLLACEAE

Arenaria lateriflora L. Frequent; moist thickets and clearings; native. Coll.: 3 miles W of Cornwall, wet sandy woods (7671). Obs.: Steen I., clearing.

Stellaria media (L.) Cyrillo Common; widespread weed in gardens

(not along shore of River); adventive. Coll.: Sheek I., pastured woods (8062); Aultsville, garden (15624).

Stellaria longifolia Muhl. Scarce; moist clearings; native. Coll.: 3 miles W of Cornwall, swampy clearing (15145).

Cerastium vulgatum L. Common; weed of waste places, lawns and gardens, also present along upper beach-lines; adventive. Coll.: Sheek I. (2334); Steen I., shore (8247); Cardinal, sandy beach (14932). Obs.: Mille Roches, along railroad; Morrisburg, along canal; Indian I., by cottage.

Lychnis alba Mill. Common; weed of hayfields and waste land; adventive. Coll.: Aultsville, field (15573).

Silene cucubalus Wibel Scarce; weed of waste places and fields; adventive. Obs.: Mille Roches, along railroad (no collections).

Saponaria officinalis L. Common; abundant along roadsides near old gardens, waste places in towns; introduced and escaping. Coll.: Iroquois, ditch (15315).

#### CERATOPHYLLACEAE

Ceratophyllum demersum L. Common; quite abundant in slow or fast waters of River and in inlets thereto; completely submerged and entangled in rooted aquatics or debris; plants brittle and abundantly cast on shore; native. Coll.: Grassy I. (8008); Wales, in Hoople Creek (8214); Aultsville, tangled in submerged aquatics, inlet (15567); Iroquois, clogging canal (15435), fast water among weeds (15439); Prescott, shallow water (14894).

#### NYMPHAEACEAE

(Nuphar microphyllum (Pers.) Fern. In Nash (Hosaic) Creek, 5 miles NE of Morrisburg (15525); not seen in study area.)

Nuphar rubrodiscum Morong Frequent; muddy inlets and streams, shallow bays of River; native. Coll.: Aultsville Station, muddy stream (14613); E of Morrisburg, muddy inlet (15419).

Nuphar variegatum Engelm. Frequent; muddy inlets; native. Obs.: mouth of Hoople Creek; bay of St. Lawrence near Iroquois (no collections).

Nymphaea tuberosa Paine Frequent; shallow bays of St. Lawrence; native. Coll.: 2 miles above Aultsville (15674, 15675). Obs.: mouth of Hoople Creek; complete cover in lagoon off canal above Iroquois.

## RANUNCULACEAE

Ranunculus trichophyllus Chaix Probably frequent; shallow water of St. Lawrence; native. Coll.: 3 miles below Prescott (14895).

Ranunculus longirostris Godr. Common; shallow water of St. Lawrence, sterile plants often abundant on wet shores; native. Coll.: Sheek I., in water (15506); Aultsville, deep water, sterile (15601), in dense masses, flowering (14543).

Ranunculus reptans L. Common; wet shores of St. Lawrence; native. Coll.: Sheek I., sandy shore (8072); Wagners I., river shore (8036); Steen I., mats on wet sandy beach (7721, 15658); Iroquois, beachline (14798); Iroquois Point, wet sandy beach (14823); Cardinal, shoreline (8120), sod on shoreline (14928).

Ranunculus sceleratus L. Common; wet shores of St. Lawrence and in trampled mud along inlets, plants often present only as vigorous sterile rosettes; native. Coll.: Long Sault, wet sandy beach (15122); Cardinal, shoreline (8108), wet sandy beach (14929); Tuttle Point, rosettes abundant on wet shore (14849). Obs.: Morrisburg, trampled mud; Iroquois, shore; Toussaint I., shore.

Ranunculus abortivus L. Scarce; woods and clearings; native. Coll.: 3 miles W of Cornwall, clearing (8331); Sheek I., clearing in maple woods (8441); Wales, gravel hillside (7808).

Ranunculus recurvatus Poir. Rare; wet woods; native. Coll.: Long Sault, low woods by shore (15115).

Ranunculus acris L. Very common; fields, roadsides, canal banks, waste land; adventive. Coll.: Sheek I. (2370, 14404). Obs.: listed at: Mille Roches; Long Sault; Steen I.; Morrisburg; Iroquois; Iroquois Point; Toussaint I.



Thalictrum dioicum L. Frequent; wooded slope to River; native.  
Coll. : Sheek I. (7619, 8390, 8450).

Thalictrum polygamum Muhl. Common; wet meadows and woods;  
native. Coll. : opposite lower end of Barnhart I. , riverbank (15516);  
3 miles W of Cornwall, low woods (7978); Wales, swampy woods  
(7759, 7760).

Hepatica acutiloba DC. Scarce; woods; native. Coll. : 3 miles W of  
Cornwall (8355). Obs. : Wales, rich woods.

Anemone riparia Fern. Frequent; dry woods and clearings; native.  
Coll. : Sheek I. , woods on riverbank (14407), clearing (2362); Long  
Sault, grassy shore (15484).

Anemone canadensis L. Common; banks of the River and railroads,  
moist meadows; native. Obs. : listed at: Mille Roches; Sheek I. ;  
Steen I. ; Morrisburg; Iroquois; Iroquois Point; Prescott (no collections).

Clematis virginiana L. Scarce; wet woods and thickets; native.  
Coll. : Cardinal, in thicket in wet land (14864). Obs. : Steen I. ,  
thicket; Iroquois, wet woods.

Caltha palustris L. Frequent; swampy land; native. Coll. : 3 miles  
W of Cornwall, marsh in woods (8368); Iroquois, wet woods (8411).

Coptis groenlandica (Oeder) Fern. Frequent; moist sandy woods back  
from River; native. Coll. : 3 miles W of Cornwall, dense woods  
(7673, 8460); Wales, deep woods (8453). Obs. : Mille Roches; Farran  
Point; Aultsville Station.

Aquilegia canadensis L. Frequent; dry woods and clearings; native.  
Coll. : 3 miles W of Cornwall, moist sandy woods (7675); Sheek I. ,  
clearing in maple woods (8445), steep bank to River (8396, 14395,  
15094). Obs. : Steen I. , dry bank.

Actaea rubra (Ait.) Willd. Common; moist woods and clearings;  
native. Coll. : 3 miles W of Cornwall, moist sandy woods (8362);  
Sheek I. , wooded slope to River (8391), abundant in woods (8423), open  
bank of River (2382), woods (f. neglecta, 7616); Long Sault, low woods  
(15114); Wales, low woods (8385).

Actaea pachypoda Ell. Scarce; woods; native. Coll.: Steen I., solitary plant in woods (14553).

#### BERBERIDACEAE

Podophyllum peltatum L. Scarce; only on islands and near shore of River, dry soil; native, probably transported by Indians. Coll.: Sheek I., maple-beech woods (8434); Steen I., patch of woods at upper end (15646); Toussaint I., "parkland" at upper end, fruiting (15401, fig. 15). Obs.: Cornwall I., but not elsewhere.

Caulophyllum thalictroides (L.) Michx. Occasional; rich woods; native. Obs.: head of Robertson's Creek, rich woods; Sheek I., beech-maple woods (no collections).

Berberis vulgaris and B. thunbergii; cultivated in town of Iroquois, not seen in wild (no collections).

#### MENISPERMACEAE

Menispermum canadensis L. Obs.: a doubtful record, on fence along highway near Farran Point, where it would be planted; not seen in any wild habitat.

#### PAPAVERACEAE

Sanguinaria canadensis L. Frequent; patches in moist woods and on embankments; native. Coll.: Mille Roches, railroad ditch (15172); Sheek I., woods (8425); Wales, low woods (8374). Obs.: Indian I.

#### CRUCIFERAE

Berteroa incana (L.) DC. Rare; waste places; adventive. Coll.: Morrisburg, fence-row along highway (Montgomery 1126). Obs.: not a general weed.

Lepidium densiflorum Schrad. Common; weed of roadsides and waste places; adventive. Coll.: Sheek I. (2363).

Capsella bursa-pastoris (L.) Medic. Common; garden and wasteland weed; adventive. Obs.: Aultsville, at dock; Iroquois, railroad (no collections).

Brassica kaber (DC) L. C. Wheeler Common; weed of fields and waste places, sometimes on beaches; adventive. Coll.: Wales, bank of Hoople Creek (8204); Prescott, shore (14878). Obs.: Crysler Farm, shore; Morrisburg, shore; Toussaint I., bank.

Erucastrum gallicum (Willd.) O. E. Schultes Common; weed of railroads; adventive. Coll.: Morrisburg, railroad gravel (15375); Iroquois, railroad weed (15309).

Erysimum cheiranthoides L. Common; weed of roadsides, waste places, fields; adventive. Coll.: Aultsville, shore (15580).

(Rorippa sylvestris (L.) Bess. Cornwall, garden (Shumovich 1442).)

Rorippa islandica (Oeder) Borbas Frequent; marshes, shores of streams; native. Coll.: Aultsville, marshy shore (15682); Iroquois, muddy creek bank (14648); Prescott, sand beach (14889).

Armoracia lapathifolia Gilib. Frequent; roadsides and waste places; introduced, escaped from cultivation. Coll.: Iroquois (8405).

Barbarea vulgaris R. Br. Frequent; weed of fields, often abundant along shores; adventive. Coll.: Morrisburg, highway-side.

Dentaria diphylla Michx. Scarce; woods; native. Coll.: 3 miles W of Cornwall, rich woods (8345). Obs.: Sheek I.; Wales, woods.

Dentaria maxima Nutt. Rare; woods; native. Coll.: Sheek I., steep slope to River wooded with beech (8389).

Cardamine pensylvanica Muhl. Scarce; margins of pools; native. Coll.: 3 miles W of Cornwall, edge of pool in woods (8358).

Arabis divaricarpa Nels. Rare; dry bank of River; native. Coll.: Sheek I., steep bank to rapids (15083). Obs.: not seen elsewhere.

#### CRASSULACEAE

Sedum (purpureum?) Scarce; observed at two points on Sheek I. (no collections).



## SAXIFRAGACEAE

Penthorum sedoides L. Scarce, but of wide occurrence; edges of marshes; native. Coll.: Mille Roches, shore of stream (8102); Iroquois, creek edge (14645); Cardinal, wet shore of St. Lawrence (14909).

Tiarella cordifolia L. Common; rich moist woodlands; native. Forms with yellow and orange (f. allanthera) anthers both present. Coll.: 3 miles W of Cornwall, rich woods (8337, 8338); Long Sault, deep shade (15117); Wales, swampy woods (8376), woods (8464).

Mitella diphylla L. Scarce; rich woods; native. Coll.: Sheek I., beech-maple woods (8437); Wales, low woods (7773, 8378).

Mitella nuda L. Scarce; woods; native. Coll.: Wales; hummock in wet woods (8463).

Ribes cynosbati L. Common; open woods and clearings; native. Coll.: Cornwall, 3 miles W, woods (8349); Sheek I., maple bush (2393, 8440) woods on shore (7611, 14406); Long Sault, low woods (15108); Wales, swampy woods (8373), gravelly hillside (7799); Iroquois, woods (8407).

Ribes hirtellum Michx. Scarce; swampy woods; native. Coll.: 2 miles NE of Wales, low woods (7793).

Ribes sativum Syme Rare; escaped from cultivation; introduced. Coll.: Sheek I., woods (8422).

Ribes americanum Mill. Common; woods; native. Coll.: Sheek I., wooded bank (8392, 9385, 8439), woods (8432); Long Sault, low woods (15109); 2 miles NE of Wales, low woods (7789); Wales, ash woods (8375); Indian I., moist woods (15685); Iroquois, roadside (8404), wet woods (8414).

## HAMAMELIDACEAE

Hamamelis virginiana L. Rare, localized at or below Long Sault rapids; dry woods; native. Coll.: Cornwall I. (8002); 3 miles W of

Cornwall, sandy woods (15153); Sheek I., wooded bank (14410, figure 34).  
Obs.: not seen elsewhere.

## ROSACEAE

Spiraea alba Du Roi Common; forming dense stands in thin woods or clearings on wet sandy land; native. Coll.: Wales (7742); Farran Point (7838).

Spiraea latifolia (Ait.) Borkh. Probably common; native. Obs.: Farran Point, old field on moist sandy land (no collection).

Spiraea tomentosa L. Frequent; moist sandy pastures; native. Coll.: Sheek I. (2364); Farran Point (7843); Steen I. (7943) Obs.: Mille Roches, abundant in moist sandy field; Wales, woods; Aultsville Station, old field on wet sand; absent or at least not visibly prevalent, in terrain to north as far as Osgoode.

Pyrus malus L. Common; contributing to thickets along banks of canal and River, and in fencerows; introduced and escaped. Coll.: Sheek I. (8420). Obs.: commercial orchards are numerous on the valley slope especially between Cardinal and Aultsville.

Aronia melanocarpa Michx. Rare; abundant in swampy land on sand; native. Coll.: 3 miles W of Cornwall (7682, 15152). Obs.: not seen elsewhere.

Sorbus aucuparia L. Frequently planted; introduced. Coll.: Steen I., a few trees in bush by cottages (15642).

Amelanchier stolonifera Wieg. Scarce; wet sandy clearing; native. Coll.: 3 miles W of Cornwall, powerline-cut through woods on marshy soil (7683).

Amelanchier intermedia Spach Common; second-growth scrub and on moist soil; native. Coll.: Sheek I., sandy bank to River (14425); Wales, gravel pit (8416).

Crataegus Hawthorns are abundant throughout the area especially on the steep banks of the River or lining their crests where they may be native and from where they have colonized old fields, pastures and

fencerows. The complex has not been fully collected in the area but the following are tentatively separated from the material available:-

Crataegus punctata Jacq. Common; along margins of the River and invading old fields and fencerows; native. Coll.: Long Sault, shore (15125); Steen I., maple woods (7707), riverbank (7718), old hay field (8254); Morrisburg, field (8281); Cardinal, pasture (14910); 3 miles below Prescott, riverbank (14897).

Crataegus chrysocarpa Ashe Occasional; riverbanks and pastured woodland; native. Coll.: Farran Point, poplar woods (7859); Steen I., river shore (8253); Toussaint I., pastured parkland (15394); Prescott, bank of St. Lawrence (14874).

Crataegus submollis Sarg. Scarce; fields and woods; native. Coll.: Steen I. (8255, 14559).

Crataegus succulenta Link var. macrantha (Lodd.) Egglest. Scarce; dry banks of the River and old fields; native. Coll.: Wagners I., riverbank (8029); Wales, gravel hillside (7800); Steen I., bank of St. Lawrence (14583).

Fragaria virginiana Duchesne Very common; dry fields and banks, open woods; native. Coll.: Sheek I. (8397); Wales (8370); Steen I. (14578). Obs.: many stations.

Fragaria vesca L. Scarce; woods; native. Coll.: Wales (14432). Obs.: Sheek I., in woods.

Potentilla argentea L. Rare; waste places; adventive. Coll.: Mille Roches, cinders of roadway (15177). Obs.: not listed at any other site.

Potentilla recta L. Scarce; waste land; adventive. Coll.: Mille Roches, railroad embankment (15179).

Potentilla norvegica L. Frequent; sand beaches of the River and waste places; native, spreading as a weed. Coll.: Steen I., beach (8267). Obs.: Morrisburg, waste area by canal.

Potentilla intermedia L. Frequent; embankments and waste land; adventive. Coll.: Mille Roches, cinders by railroad (15178); Steen I., sandy beach (8272).



Potentilla anserina L. Very common; wet beaches and shores of the River and in wet places elsewhere; native. Coll.: Sheek I., low ground (2367), shore rocks at rapids (7609, 15090); Wagners I., shore gravel (8026); Steen I., shore (7734), sand beach (8271); Cardinal, shore (8110), sand beach (14927);

Geum canadense Jacq. Common; deep woods and moist thickets; native. Coll.: 3 miles W of Cornwall, wet woods (7676); Sheek I. (2358); Wales, low woods (7762, 7786); Steen I., maple woods (7701, 7713).

Geum aleppicum Jacq. Frequent; old fields; adventive. Coll. Sheek I., grassy area (2343). Obs.: Steen I.; Aultsville Station; Morrisburg; Toussaint I.

Rubus pubescens Raf.\* Frequent; moist woods; native. Coll.: Wales (8371, 8460). Obs.: Aultsville Station, wet places; Iroquois, swampy woods.

Rubus odoratus L. Occasional; clearings in dry woods; native. Coll.: Sheek I. (7618); Steen I. (15630). Obs.: Indian I., woods; Iroquois, low woods.

Rubus strigosus Michx. \* Very common; thin woods, clearings, old fields, embankments; native. Coll.: Steen I. (15655, figure 37).

Rubus occidentalis L.\* Frequent; dry clearings; native. Coll.: Sheek I. (15496). Obs.: Wales, open woods; Steen I., thicket.

Rubus hispidus L.\* Frequent; carpeting the ground in moist sandy woods; native. Coll.: 3 miles W of Cornwall (14414); Farran Point (7845, 7858).

Rubus setosus Bigel.\* Scarce; old sandy fields; native. Coll.: Aultsville Station (7867).

Rubus canadensis L.\* Frequent; forming extensive tangles in moist clearings; native. Coll.: Mille Roches (15165).

Rubus allegheniensis Porter \* Common; forming bramble thickets in scrubby woods, old fields and clearings; native. Coll.: Long Sault (15110); Farran Point (7856); Indian I. (15690).

\*Names used in the sense of the broad collective species.

Agrimonia gryposepala Wallr. Common; open woods, clearings, thickets, old fields; native. Coll.: Cornwall I., grown-over pasture (9986); 3 miles W of Cornwall, thicket (7686); Sheek I., river bank (2396); Wales, woods (8244); Farran Point, damp woods (7860). Obs.: Steen I.; Indian I.; Morrisburg.

Rosa virginiana Mill. Frequent; thickets; native. Coll.: Iroquois (14838).

Rosa blanda Ait. Common; thickets along banks of the River; native. Coll.: Sheek I. (15142, 15507); Long Sault (15095); Iroquois (15440).

Prunus nigra Ait. Occasional; high banks of River or shoreline thickets; native. Coll.: Steen I. (14624); Morrisburg (15283). Obs.: 3 miles W of Cornwall, woods.

Prunus pensylvanica (L.) f. Frequent; abundant in low second-growth woods on wet sandy land and invading old fields; native. Coll.: Sheek I. (8402, 8430). Obs.: Farran Point, old fields; Steen I., thicket.

Prunus serotina Ehrh. Scarce; woods or thickets; native. Coll.: Mille Roches, two isolated large trees by fence along canal (15518); Indian I., woods (15702). Obs.: Steen I., small tree in woods; Iroquois, large tree on high bank of inlet.

Prunus virginiana L. Very common; thickets along roadsides and river banks; native. Coll.: Sheek I. (2430); Iroquois (8415, 14631).

Prunus (sp. ?), a racemose cherry with coarsely serrate acuminate blades, possibly P. ssiori Schmidt; adventive. Coll.: Steen I., in bush (14550).

## LEGUMINOSAE

Trifolium pratense L. Very common; arable meadows, roadsides, old fields; adventive. Coll.: Sheek I. (2346); Morrisburg (15368).

Trifolium repens L. Very common; pastures, lawns, waste places; adventive. Coll.: Sheek I. (2373); Aultsville (s.n.)

Trifolium hybridum L. Common; arable meadows, moist waste places; adventive. Coll.: Morrisburg (15373).

Trifolium agrarium L. Frequent; fields, disturbed ground; adventive. Coll.: Sheek I. (2366); Steen I. (15636). Obs.: Aultsville Station, old field; Morrisburg, waste area.

Trifolium procumbens L. Frequent; pastures and waste ground; adventive. Coll.: Morrisburg (15301, 15374).

Melilotus officinalis (L.) Lam. Rare; waste places; adventive. Obs.: Morrisburg, along canal (no collections).

Melilotus alba Desr. Very common; abundant along roadsides, canal banks and shores; adventive. Coll.: Sheek I. (2368, 7921); Farran Point (15673).

Medicago sativa L. Frequent; arable meadows; introduced, sparingly escaped. Obs.: Iroquois, shore bank; Iroquois Point, along beach (no collections).

Medicago lupulina L. Very common; pastures and waste places, or along shoreline of the River; adventive. Coll.: Sheek I. (2341); Steen I., upper beach (14577). Obs.: Long Sault, shore; Mille Roches, railroad; Morrisburg, along canal in pastures; Iroquois, shore, railroad; Toussaint I., pastures.

Robinia pseudo-acacia L. Common; planted along shoreline properties and escaping to banks adjoining; introduced. Coll.: Aultsville, highway park at canal (15476).

Astragalus canadensis L. Rare; steep bank of the River; native. Coll.: Wagners I., a few plants (8032). Obs.: not encountered elsewhere.

(Desmodium canadense (L.) DC. Rare; native. Coll.: Cornwall I., rough land (7995). Obs.: not encountered elsewhere.)

Vicia cracca L. Common; hayfields, road and canal embankments, waste land; adventive. Coll.: Sheek I. (2347); Iroquois (14843). Obs.: at numerous stations.

Lathyrus palustris L. Frequent; marshy areas along shore of River; native. Coll.: 3 miles W of Cornwall, riverbank (15614); Sheek I.,



riverbank (2380); Morrisburg, shore-marsh (15300).

Apios americana Medic. Rare; shoreline thicket at Long Sault rapids only; native, probably transported by Indians. Coll.: Sheek I., springy bank (7647).

Amphicarpa bracteata (L.) Fern. Common; abundant along rocky banks of the River and in wet thickets "inland"; native. Coll.: Robinson's Creek, creek bank (7961); Aultsville Station, moist pasture (14605); Iroquois, shore (14630). Obs.: Long Sault, shore; Wales, wet woods; Morrisburg, shore; Iroquois, wet woods; Iroquois Point, beach.

Amphicarpa bracteata var. comosa (L.) Fern. Rare; shore rocks at Long Sault rapids; native, possibly transported by Indians. Coll.: Sheek I., rocky shoreline (14390).

#### OXALIDACEAE

Oxalis montana Raf. Rare; in pine woods; native. Coll.: Wales, woods (14433).

Oxalis europaea Jord. Common; weed of gardens and waste places; native on dry eroding banks of the River. Coll.: Sheek I., grassy area (2350); Aultsville, shoreline waste area (s.n.); Morrisburg, garbage heap on shore (15351). Obs.: recorded at numerous sites.

#### GERANIACEAE

Geranium robertianum L. Scarce; deep rich woods; native. Coll.: Sheek I., pastured maple woods (8063); Long Sault, low woods (15106).

#### RUTACEAE

Xanthoxylum americanum Mill. Scarce; forming thickets along shoreline and on rough roadsides; native. Coll.: Long Sault, shore (15493); Wales, roadside (7658, 7659). Obs.: extensive clones in old pastures and clearings on rocky land, west of Wales; not seen at other points.

#### POLYGALACEAE

Polygala sanguinea L. Rare; sandy land; native. Coll.: Farran Point, pasture (7842).

## EUPHORBIACEAE

Acalypha rhomboidea Raf. Common; wet woods, more frequently as weed along eroding shores and in waste places; native. Coll.: above Cornwall, slipping bank of River (15612); Wales, moist woods (8232); Steen I., cut-bank of River (14582); Morrisburg, dump on shore (15351X).

Euphorbia platyphylla L. Scarce; disturbed soil; adventive. Coll.: Iroquois, a few plants in trampled mud in pasture (14647).

Euphorbia helioscopia L. Scarce; waste land weed; adventive. Coll.: above Cornwall, disturbed soil on shore, a single plant (15517); Morrisburg, highway side (s.n.), garden (Montgomery 1122).

Euphorbia supina Raf. Probably common; weed on railroads; adventive. Coll.: Farran Point (15671); Morrisburg (15365A).

Euphorbia maculata L. Probably common; weed of railroads; adventive, probably from southwestern Ontario. Coll.: Morrisburg, railroad gravel (15366).

Euphorbia vermiculata Raf. Common; weed along railroads; native on eroded dry banks of the River. Coll.: above Cornwall, bare soil on dry bank of River (15617); Sheek I., gravelly shore (8074); Morrisburg, railroad (15365B); Iroquois, railroad (15313); Toussaint I., eroded bank (15398).

Euphorbia glyptosperma Engelm. Probably common; weed on railroads; adventive. Coll.: Farran Point (15672).

## CALLITRICHACEAE

Callitriche hermaphroditica L. Common; characteristic of shallow water of the River, rooted in quiet bays, often in dense masses; native. Coll.: Aultsville, spreading in shallow water (14542); Steen I., dense masses in water inside Scirpus zone (14572); 2 miles above Aultsville, mud in bay (15679); Morrisburg, quiet cove (15444); Iroquois, mouth of inlet (14640); Iroquois Point, sandy bottom (14825); Toussaint I., shallow water (15387X).

Callitriche palustris L. Rare; in stagnant stream-pools; native.  
Coll.: 3 miles W of Morrisburg, puddle in stream (15370). Obs.:  
no other station.

#### ANACARDIACEAE

Rhus typhina L. Very common; forming coarse thickets on banks of  
the River and canals, also colonizing old fields in extensive clones;  
native. Coll.: Wales, pasture (7771), clearing (8245).

Rhus radicans L. The climbing form rare; the creeping form (var.  
rydbergii) very common; open woods, thickets, embankments; native.  
Coll.: Sheek I., extensive beds on high riverbank (15087); Long Sault,  
climbing by aerial roots for 20 feet into elm on shoreline (15482).

#### AQUIFOLIACEAE

Ilex verticillata (L.) Gray Rare; wet woods along River only; native.  
Coll.: Indian I., a solitary clump (15689). Obs.: Mille Roches, wet  
woods (sterile).

#### CELASTRACEAE

Celastrus scandens L. Common; blanketing shoreline thickets or  
strangling trees in moist woods; native. Coll.: Robinson's Creek, on  
shrubs on creek margin (7951); Sheek I., steep riverbank (14391);  
Long Sault, abundant woody vine covering shoreline thickets (15483).  
Obs.: numerous other stations.

#### ACERACEAE

Acer pensylvanicum L. Rare; woods; native. Obs.: Only in beech-  
maple woods near Wales (no collection).

Acer saccharum Marsh. Very common; dominant tree in original  
forests on gravelly or well-drained soil, now existing in second-growth  
stands, or as old trees in pure stands in "sugarbushes"; native. Coll.:  
Moulinette, on rocky moraine (15527); Sheek I., seedlings abundant in  
maple-beech woods (8448); Steen I., large trees in sugarbush (14564);  
Crysler Farm, planted by monument (15683, figure 2); Iroquois Point,  
woodlot (14865).



Acer nigrum Michx. Scarce; gravelly or sandy ridges; native. Coll.: Moulinette, on rocky moraine (15528); Farran Point, large trees in sandy forest (15666).

Acer rubrum L. Common; large trees with white pine on poorly drained sandy land, abundant in second-growth woods; native. Coll.: 3 miles W of Cornwall, young plants with silver-mottled leaves in red maple-white pine woods (14415), woods (8348); Mille Roches (15168); Steen I., seedlings on beach-line (s.n.).

Acer saccharinum L. Common; along shoreline of River and inlets, in swampy woods with ash, elm and willow; native. Coll.: Long Sault, shore (15139).

Acer negundo L. Common; shade tree around farms and weedy along canal banks and shores; adventive. Coll.: Sheek I., fencerow (8431); Steen I., shore (7708). Obs.: at several stations.

#### HIPPOCASTANACEAE

Aesculus hippocastanum L. Rare; planted as a shade tree; introduced. Coll.: near Morrisburg, large tree by farmhouse, fruiting abundantly (15298).

#### BALSAMINACEAE

Impatiens capensis Meerb. Very common; lining water of streams, inlets and bays, also in wet woods; native. Coll.: Steen I., maple woods (7706); Morrisburg, among rocks on shore of inlet (15418); Prescott, upper shoreline (14870).

Impatiens glandulifera Royle Rare; escape from cultivation; introduced. Coll.: Iroquois, edge of River (Victorin 56840). Obs.: not encountered in survey.

#### RHAMNACEAE

Rhamnus cathartica L. Rare; riverbank woods; adventive. Coll.: Long Sault, wet woods (15128).

(Ceanothus americanus L. Cornwall Island, woods (Victorin 56871); not encountered in study area immediately upstream.)

## VITACEAE

Parthenocissus inserta (Kerner) K. Fritsch Common; riverbank thickets and moist woods, spreading to fences and roadside thickets; native. Coll.: Long Sault, riverbank thicket (15490); Wagners I., riverbank (8031); Steen I., common in bush (15645).

Vitis riparia Michx. Very common; characteristic of the banks of the River, climbing into trees and blanketing thickets, also found in clearings "inland"; native. Coll.: Sheek I., shore (2398, 14409, 15093); Mille Roches, railroad bank (15171); Wales, low woods (7758); Iroquois, shore (14626).

Vitis (aestivalis ?) Cultivated grapes are not now economically grown, although vines still persist on an orchard fence between Aultsville and Dickinson Landing (no collections).

## TILIACEAE

Tilia americana L. Common; a tree of original woodland on well-drained soils; native. Coll.: Sheek I., bank (15097); Wagners I., bank (8027); Sheek I., woods (14625); Toussaint I., parkland (15400).

## MALVACEAE

Malva neglecta Wallr. Common; garden and waste place weed; adventive. Coll.: Aultsville, field margin (15574); Iroquois, garden (15316).

Malva (? pusilla Sm.) Common; waste place weed; adventive. Obs.: "small-flowered round-leaved mallows" noted near Morrisburg (waste place) and Iroquois (railroad) are considered to be distinct from above species (no collections).

## HYPERICACEAE

Hypericum perforatum L. Common; weed of old fields, embankments and roadsides; adventive. Coll.: Sheek I., field (8056), grassy area (2352); Wagners I., pasture (8038); Steen I., old field (s.n.). Obs.: numerous stations.

Hypericum punctatum Lam. Rare; rough land or clearings; native. Coll.: Wales, gravel pit (7796); Aultsville Station, second-growth woods (14616).

Hypericum boreale (Britt.) Bickn. Rare; wet bare ground; native. Coll.: Aultsville Station, wet wood-road (14618). Obs.: no other sites.

Hypericum canadense L. Scarce; moist open soil in fields and along beaches; native. Coll.: Aultsville Station, old sandy field (7869); Presqu'ile, sand beach (8140).

Hypericum virginicum L. Scarce; wet land and shores; native. Coll.: Sheek I., river shore (7924); Aultsville Station, wet sandy pasture (14617). Obs.: no other sites.

#### VIOLACEAE

Viola papilionacea Pursh Frequent; woods; native. Coll.: Robinson's Creek, woods (8363); Sheek I., woods (8427), beech-maple woods (8435), wooded slope (8398); Wales, ash woods (8367); Iroquois, dry cedar woods (8409).

Viola septentrionalis Greene Common; woods; native. Coll.: Robinson's Creek, woods (8353, 8365); Sheek I., maple-beech woods (8449); Wales, ash woods (8365, 8379, 8383); Iroquois, dry cedar woods (8408). Obs.: numerous stations.

Viola pallens (Banks) Brainerd Common; woods, clearings and moist pastures; native. Coll.: 3 miles W of Cornwall, woods (8340, 8357, 8364); Sheek I., pasture (8401); Wales, ash woods (8462), beech-maple-hemlock woods (8455).

Viola pubescens Ait. Scarce; woods; native. Coll.: Sheek I., clearing (8442).

Viola pensylvanica Michx. var. leiocarpa (Fern. & Wieg.) Fern. Common; woods and shaded slopes; native. Coll.: 3 miles W of Cornwall, rich deciduous woods (8336); Sheek I., beech-maple woods (8436), dry woods (7615); Wales, dry woods (8418), ash woods (8366); Steen I., maple woods (7704); Iroquois, wet elm woods (8413).



Viola canadensis L. Scarce; dry woods and clearings; native.  
Coll. : Wales, gravel hillside (7810), dry ash woods (8467). Obs. :  
no other records.

Viola conspersa Reichenb. Frequent; mixed and deciduous woods,  
occasionally in cedar glades; native. Coll. : Robinson's Creek,  
deciduous woods (8343), mixed woods (8354); Wales, flooded ash woods  
(8462); Sheek I., maple-beech woods (8444); Iroquois, cedar woods  
(8410). Obs. : frequently seen throughout wooded areas.

Viola rostrata Pursh Rare; deciduous wooded slopes; native. Coll. :  
Wales (8386). Obs. : no other records.

#### ELAEAGNACEAE

Shepherdia canadensis (L.) Nutt. Rare; woods and thickets; native.  
Coll. : Wales, roadside (7766). Obs. : no other sites.

#### LYTHRACEAE

Lythrum salicaria L. Common; in marshes all along the St. Lawrence  
and shores of adjoining inlets, but not forming extensive stands as in  
low land elsewhere in eastern Ontario; adventive. Coll. : Grassy I.,  
muddy shore (8023); Steen I., riverbank (7222); Morrisburg, marshy  
shore (15289).

#### ONAGRACEAE

Ludwigia palustris (L.) Ell. var. americana (DC.) Fern. & Grisc.  
Frequent; characteristic of muddy shores, often submerged; native.  
Coll. : Aultsville Station, mud of stream (14614); Morrisburg, slow  
stream (15371); Cardinal, beach of River (14933).

Epilobium angustifolium L. Scarce; along railroads especially; native.  
Coll. : Wales, patch along tracks (7661).

Epilobium hirsutum L. Becoming common; many marshy places and  
swampy ditches but only near the River and its adjacent main highway;  
adventive. Coll. : Sheek I., muddy river shore (8173); Mille Roches,  
meadow by stream (8094); Aultsville, drain (s.n.); Iroquois, marsh by  
highway (14643); Presqu'ile, swamp (8150); Tuttle Point, rock-fill by  
canal (14851).

Epilobium strictum Muhl. Apparently rare; shore of the River; native. Coll.: Sheek I., marshy shore below dam (7928).

Epilobium leptophyllum Raf. Probably frequent; sedge meadows; native. Coll.: Iroquois, wet meadow (15376); Presqu'ile, sedge marsh (8149).

Epilobium coloratum Biehler Probably frequent; sedge marshes, wet woods and creek banks; native. Coll.: Wales, bank of Hoople Creek (8195); Aultsville Station, shaded creek bank (14609); Iroquois, wet woods (14935); Presqu'ile, sedge marsh (8149X).

Epilobium glandulosum Lehm. var. adenocaulon (Haussk.) Fern. Common; weedy on river shores, moist fields and waste places; native. Coll.: Cornwall I., woods (8000); Wales, hillside (7901); Morrisburg, along stream in pasture (15370x); Tuttle Point, rock-fill by canal (14850).

Oenothera biennis L. Common; abundant along upper shorelines, and elsewhere in waste places; native, spreading locally as a weed. Coll.: Steen I., shore of River (7940). Obs.: at many sites "Oenothera" was recorded, perhaps more than one entity involved.

Oenothera perennis L. Rare; old sandy fields; native. Coll.: Aultsville Station, moist sandy field (7870). Obs.: no other site.

Circaea quadrisulcata (Maxim.) Franch & Savi var. canadensis (L.) Hara Common; abundant in rich woodland; native. Coll.: Sheek I., wooded slope (7648); Wales, low woods (7746); Steen I., maple woods (7700). Obs.: abundant on Indian I.

Circaea alpina L. Common; characteristic of wet woods, often on the raised soil by roots or stumps of trees; native. Coll.: 3 miles W of Cornwall, moist woods (7939); Wales, swampy woods (7794).

#### HALORAGACEAE

Myriophyllum exalbescent Fern. Common; an abundant water-weed, rooted in bottom and often intermixed with other aquatics, generally completely submerged and sterile with stems up to 6 feet long and leafless except towards end; native. Coll.: above Cornwall, fast

back-water (15510); Sheek I. , rooted in crevice of limestone bed-rock at lower end (15505); Dickinson Landing, shallow water (8015); Aultsville, deep water (15588), flowering in River (14541); Iroquois, rooted in firm bottom (15306); Toussaint I. , deep water (15391); Prescott, shallow water of beach (14891X).

## ARALIACEAE

Aralia nudicaulis L. Frequent; dry sandy woods; native. Coll. : Sheek I. , wooded slope to River (8393); Indian I. , sandy woods (15701). Obs. : 3 miles W of Cornwall; Steen I. ; Iroquois.

Panax trifolius L. Frequent; moist sandy woodland; native. Coll. : 3 miles W of Cornwall, sandy woods (14437), clearing in rich woods (8332); Mille Roches, abundant in woods (15163). Obs. : Wales, woods.

## UMBELLIFERAE

Hydrocotyle americana L. Frequent; wet woods and pastures; native. Coll. : 3 miles W of Cornwall, wet trail in woods (14443); Wales, meadow (7662); Farran Point, damp woods (7865). Obs. : Aultsville Station, wet woods; Iroquois, mucky woods.

Sanicula gregaria Bickn. Common; woods and clearings; native. Coll. : Long Sault, low woods (15111); Wales, swampy woods (7787), clearing (7809); Farran Point, sandy woods (15663); Steen I. , maple woods (7701X).

Osmorhiza longistylis (Torr.) DC. Frequent; rich woods; native. Coll. : Long Sault, low woods (15112); Steen I. , abundant in maple woods (7699).

Zizia aurea (L.) Koch Rare; woods; native. Coll. : Long Sault, woods along river shore (15120). Obs. : no other records.

Cicuta bulbifera L. Common; marshes and water margins; native. Coll. : Mille Roches, shore of stream (8100); Presqu'ile, mucky swamp (8134); Tuttle Point, mucky shore of River (14852). Obs. : numerous stations.

Cicuta maculata L. Frequent; shores and swamps; native. Coll. : Robinson's Creek, swampy woods (7976); Sheek I. , wooded springy



slope (14403); Wales, low woods (7743). Obs.: several other stations.

Cryptotaenia canadensis (L.) DC. Rare; dry woods; native. Coll.: Steen I., dense stand in clearing in sugar bush (14566).

Aegopodium podagraria L. Persisting in gardens; introduced. Obs.: a few sites in towns (no collections).

Carum carvi (or Daucus carota?). Rare; roadside weed; adventive. Obs.: a few plants were noticed along highway shoulder near Aultsville, otherwise the area appears free of white-flowered umbelliferous weeds which are so abundant in land between Winchester and Ottawa (no collections).

Sium suave Walt. Common; shallow water or swamps; native. Coll.: Mille Roches, shore of stream (8103); Sheek I., river shore (8168); Grassy I., muddy place (8022). Obs.: numerous stations.

Angelica atropurpurea L. Scarce; in wet meadows at points near the River only; native. Coll.: Crysler's Farm (14449). Obs.: Farran Point; several sites between Aultsville and Morrisburg; Iroquois; Iroquois Point.

Pastinaca sativa L. Very common; an abundant weed on fields, on roadsides and embankments or along the shorelines; not extending in abundance back from the shore-line properties; adventive. Coll.: Sheek I. (2365); Morrisburg (15297).

Heracleum lanatum Michx. Scarce; in woods on islands in River only; native. Coll.: Steen I., several plants in dense thicket (14586); Indian I., deep woods (15691). Obs.: at no other sites.

## CORNACEAE

Cornus canadensis L. Scarce; woods; native. Obs.: W of Cornwall; Wales; Aultsville Station (no collections).

Cornus stolonifera Michx. Common; shorelines and banks of the River; native. Coll.: Sheek I., steep bank to rapids (14396), abundant shrub on shore (7919), open area (2354); Long Sault, common low shrub on shore (15138).

Cornus rugosa Lam. Probably scarce; dry riverbanks; native.  
Coll.: Sheek I., steep bank to rapids (14392).

Cornus obliqua Raf. Frequent; dry riverbanks and rough land; native.  
Coll.: Cornwall I., grown-over pasture (7984, 7994); Steen I.,  
rivershore (7715); Toussaint I., along shore (15390).

Cornus racemosa Lam. Occasional; forming dense thickets along  
riverbank; native. Coll.: Cornwall I., over-grown pasture (7990);  
Indian I., shorebank (15700).

Cornus alternifolia L. f. Occasional; open woods; native. Coll.:  
Sheek I., in woods on riverbank (14393, 14412).

#### ERICACEAE

Pyrola elliptica Nutt. Scarce; sandy woodland; native. Coll.: 3 miles  
W of Cornwall, moist woods (7637). Obs.: Aultsville Station, sandy  
woods.

Kalmia angustifolia L. Rare; wet sandy soil; native. Coll.: 3 miles  
W of Cornwall; wet sandy clearing (7641). Obs.: no other site.

Gaultheria procumbens L. Scarce; abundant in some moist sandy woods;  
native. Coll.: 3 miles W of Cornwall, woods (8361, 14440). Obs.:  
Farran Point, woods.

Gaylussacia baccata (Wang.) K. Koch Rare; swampy areas; native.  
Coll.: 3 miles W of Cornwall, swampy clearing (15147). Obs.: no  
other site.

Vaccinium (vacillans, corymbosum or pallidum?) Scarce; locally  
abundant in moist sandy woods; native. Coll.: 3 miles W of Cornwall,  
sandy woods (14420), sandy clearing (15148); Mille Roches, sandy moist  
woods (15160).

#### PRIMULACEAE

Lysimachia terrestris (L.) BSP. Frequent; low ground and wet shores;  
native. Coll.: Sheek I., riverbank (2397); Farran Point, swampy  
ground under willows (7852).

Lysimachia nummularia L. Scarce; sodden riverbank; native.  
Coll.: above Cornwall, moist bank of River (15607). Obs.: Sheek I.;  
Morrisburg, along creek.

Lysimachia thyrsiflora L. Frequent; swamps; native. Coll.: Grassy  
I., shore-swamp (8013); Sheek I., shoreline (2402); Morrisburg, swamp  
in mouth of Nash Creek (s. n.).

Lysimachia ciliata L. Very common; characteristic of thickets on wet  
shores of River, and in wet woods elsewhere; native. Coll.: 3 miles  
W of Cornwall, marsh (7684); Sheek I., wet bank to River (7617); Wales,  
low woods (7761, 8224); Steen I., shore (7727). Obs.: numerous  
stations.

Trientalis borealis Raf. Frequent; moist woods; native. Coll.: 3  
miles W of Cornwall, deep woods (7640); Wales, woods (8452).

#### OLEACEAE

Fraxinus americana L. Frequent; large trees in rich moist soil;  
native. Coll.: Steen I. (14588, 15654); Indian I. (15696).

Fraxinus pennsylvanica Marsh. var. austinii Fern. Common;  
characteristic of shorelines of St. Lawrence and in moist woods;  
native. Coll.: Mille Roches, moist land (15166); Indian I., woods  
(15687, 15695); Toussaint I., shore-line (15388); Prescott, bank of  
River, diseased (14898).

Fraxinus pennsylvanica var. subintegerrima (Vahl) Fern. Frequent;  
moist woods and shoreline of River; native. Coll.: Long Sault,  
shoreline (15488); Indian I., moist woods (15686); Iroquois Point, shore  
(14824).

Fraxinus nigra Marsh. Frequent; wet woods; native. Coll.: Wales,  
low ash woods (7769); Iroquois, wet woods (14938).

Syringa vulgaris L. Common; planted as ornamental shrub and  
persisting along fencerows and farm buildings; introduced (no collections).

#### GENTIANACEAE

Gentianella crinita (Froel.) G. Don Rare; sandy clearing; native. Coll.:



1 mile W of Farran Point, numerous in moist sandy clearing (15667).

Gentiana andrewsii Griseb. Rare; moist sandy land; native. Obs.: Aultsville Station, old field (no collections).

## APOCYNACEAE

Apocynum androsaemifolium L. Common; open shores, clearings, old fields, embankments; native. Coll.: Sheek I., sandy riverbank (2433); Aultsville Station, sandy clearing (s. n.). Obs.: Mille Roches, railroad embankment; Steen I., clearing; Indian I.

Apocynum cannabinum L. Scarce; open riverbank; native. Coll.: Long Sault, sterile spreading stand on grassy shore (15494X).

## ASCLEPIADACEAE

Asclepias incarnata L. Frequent; swamps and creek banks; native. Coll.: Wales, swampy woods (7750, 8242); Farran Point, willow swamp (7853).

Asclepias syriaca L. Very common; roadsides, embankments, old fields and clearings; perhaps native along the River, spreading to open sites later. Coll.: Sheek I., open grassy area (2339).

## CONVOLVULACEAE

Convolvulus sepium L. Common; characteristic of wet thickets along shore, in ditches and moist waste land elsewhere; native. Coll.: Mille Roches, bank of stream (8085); Sheek I., rocky shore (2418); Aultsville, shore (15575); Prescott, herbaceous thicket on shore (14890). Obs.: many stations.

Cuscuta gronovii Willd. Frequent; a few small patches parasitizing herbs of wet land; native. Coll.: Cornwall I. (7989); Aultsville Station (14600); Iroquois (14943). Obs.: no other stations.

## HYDROPHYLLACEAE

Hydrophyllum virginianum L. Frequent; dry woods; native. Coll.: Wales, low woods (7741), knoll in woods (14435); Steen I., dry woods (14567). Obs.: Iroquois, shoreline thicket.

## BORAGINACEAE

Lithospermum officinale L. Common; grassy embankments along river, canals and roadways, old fields; adventive. Coll.: Sheek I., dry bank of River (14397), grassy area (2336); Steen I., cut-bank of River (14581). Obs.: many stations.

Cynoglossum officinale L. Frequent; dry grassy embankments and old fields; adventive. Coll.: Sheek I. (2345). Obs.: Long Sault; Morrisburg; Iroquois.

Myosotis scorpioides L. Scarce; wet soil; adventive. Coll.: Aultsville, waste heap on shore (15579). Obs.: Iroquois, shore of inlet.

Myosotis laxa Lehm. Scarce; wet land; native. Coll.: Iroquois (14643X).

Lappula echinata Gilib. Scarce; waste land; adventive. Coll.: Cornwall I. (8004). Obs.: Iroquois, railroad; no other records.

Echium vulgare L. Frequent; waste land; adventive. Obs.: Mille Roches, railroad; Morrisburg, dry clay pasture, wharf; Iroquois, canal bank (no collections).

## VERBENACEAE

Verbena urticifolia L. Common; moist land, clearings or wet meadows; native. Coll.: Cornwall I., clearing (7999); Sheek I., pastured woodland (8061), grassy area (2337); Wales, low woods (7765); Aultsville Station, stream bank in pasture (14596).

Verbena hastata L. Common; swamps, streambanks, old fields; native. Coll.: Sheek I., shore-meadow (7626), marshy shore (7932); Wales, bank of Hoople Creek (8188); Steen I., clearing (14562), riverbank (7723); Toussaint I., dry slope to River (forma rosea Cheney, 15397); Cardinal, upper beach (14921).

## LABIATAE

Teucrium canadense L. Frequent; river shore; native. Coll.:

Sheek I. , marshy river shore (7914), rocky shore (2427); Wagners I. , pasture (8037).

Scutellaria lateriflora L. Common; shoreline marshes and wet meadows; native. Coll. : Robinson's Creek, swampy woods (7975); Sheek I. , marshy rivershore (7935A); Wales, swampy woods (7791); Aultsville Station, swamp (14608); Presqu'ile, muck-swamp (8129); Cardinal, wet land on shore (14907). Obs. : many stations.

Scutellaria galericulata L. var. pubescens Benth. Common; shoreline marshes and wet land; native. Coll. : Sheek I. , marshy river shore (7917, 7935); Aultsville Station, wet pasture (14601); Cardinal, wet shore of River (14908). Obs. : no other stations.

Nepeta cataria L. Occasional; weed in waste places and around stone piles in pastures; adventive. Coll. : Sheek I. , roadside (2357); Aultsville, waste land on shore (15577).

Glechoma hederacea L. var micrantha Moricand Frequent; weed of lawns and gardens, often present on wet shore of River; adventive. Coll. : Sheek I. , maple bush (2386); Iroquois, along street (8403); Cardinal, shoreline (8105).

Prunella vulgaris L. var vulgaris Scarce; waste places; adventive. Coll. : Wales, woods (7785).

Prunella vulgaris var. lanceolata (Bart.) Fern. Common; shores and moist places; native. Coll. : Sheek I. , grassy area (2349); Iroquois, moist sod on shore (15385), forma rhodantha (15384). Obs. : many records of "Prunella vulgaris".

Leonurus cardiaca L. Frequent; weed in disturbed ground; adventive. Coll. : Morrisburg, along canal (15305). Obs. : abundant on Steen I. , in clearings.

Galeopsis tetrahit L. var bifida (Boenn.) Lej. & Court. Scarce; weed in disturbed soil; adventive. Coll. : Wales, gravel pit (7803).

Lamium amplexicaule L. Scarce; garden weed; adventive. Coll. : Aultsville, garden (15623). Obs. : no other records.



Stachys tenuifolia Willd. Common; riverside; native. Coll.: Sheek I., springy slope to River (7620), riverbank (2379); Iroquois, shore (s.n.)  
Obs.: many records of "Stachys palustris", probably referable to the species or to Teucrium.

Monarda fistulosa L. Scarce; localized along Long Sault Rapids and inland on gravel moraines; native. Coll.: Cornwall I., grown-over pasture and rocky rivershore (7991); Sheek I., clay bank (7944, 7945, 8159), dry bank to River (14389); Long Sault, dry slope to River (15479), forma albescens Fern. (15478); 2 miles NE of Wales, gravel moraine (7739).

Lycopus uniflorus Michx. Common; wet shores, woods and pastures; native. Coll.: Sheek I., river shore (7937B, 8167); Wales, swampy woods (7749); Farran Point, damp woods (7863); Aultsville Station, wet sandy pasture (14619). Obs.: many stations.

Lycopus americanus Muhl. Frequent; mainly along wet shores of the River; native. Coll.: above Cornwall, springy bank of River (15611); 3 miles W of Cornwall, marsh (7688); Sheek I., marshy rivershore (7937A); Iroquois, sod on shore (15382).

Mentha piperita L. Scarce; wet shores of the River or creeks; adventive. Coll.: Long Sault, wet sand beach (15494); Wales, bank of Hoople Creek (8191).

Mentha arvensis L. Common; shores of the River and marshes, wet pastures and thickets; native. Coll.: Cornwall I., grown-over pasture (7985); Sheek I., marshy shore (7936), shoreline (2417); Wagners I., rocky shoreline (8041); Steen I., shore (7732); Iroquois Point, upper beach-line (14816); Iroquois, among rocks on shore (14633); Presqu'ile, swamp (8130); Cardinal, shoreline (8104).

Elsholtzia cristata Willd. Rare; weed in flower gardens and waste places, still localized around Aultsville; adventive. Coll.: Aultsville, by dock at river shore, a single plant (7836); 3 miles W of Aultsville, weed in flower bed (15582). Obs.: at no other stations.

#### SOLANACEAE

Solanum dulcamara L. Very common; moist thickets, woods, shores, embankments; adventive, often appearing as native. Coll.: Wales,

low woods (7747). Obs.: at almost every station.

Solanum nigrum L. Scarce; disturbed soil; adventive. Coll.: Wales, gravel pit (7802); Toussaint I., in hollow stump (15403). Obs.: Steen I., at sugar camp; no other stations.

Physalis heterophylla Nees Scarce; disturbed soil; adventive. Coll.: Mille Roches, on fill in churchyard (8083).

Physalis alkekengi L. Persisting and spreading in gardens; introduced. Coll.: Aultsville, edge of garden (8274).

### SCROPHULARIACEAE

Verbascum thapsus L. Common; eroded banks, pastures, waste places; adventive. Coll.: Sheek I. (2344); Steen I., upper sandy shore (8266).

Cymbalaria muralis G., M. & S. Rare; rooted in crevices of masonry of the locks at Morrisburg where persisting; introduced. Coll.: Morrisburg (15473, figure 29).

Linaria vulgaris Hill Frequent; general weed of roadsides, fields, embankments; adventive. Coll.: Cardinal, shoreline (8107).

Chaenorrhinum minus (L.) Lange Common; all along railroads; adventive. Coll.: Mille Roches, railroad cinders (15155); Iroquois, railroad (15310). Obs.: on coal wharf at Morrisburg.

Scrophularia lanceolata Pursh Frequent; grassy areas, thin woods and clearings; native. Coll.: Sheek I., shore (2420), field (7610); Wales, gravel hillside (7806); Morrisburg, water-front waste land (15082). Obs.: Steen I.: Iroquois.

Chelone glabra L. Common; marshes and riverbanks; native. Coll.: Sheek I., shore (8174, 7931); Wales, bank of Hoople Creek (8221); Farran Point, willow swamp (7850); Cardinal, marsh (15344).

Penstemon hirsutus (L.) Willd. Rare; sandy clearing; native. Coll.: 3 miles W of Cornwall, sandy knoll in swamp (7687, 15144). Obs.: no other site.

Mimulus ringens L. Frequent; wet meadows and shores; native. Coll.: Sheek I., sedge meadow on river shore (7654); Wales, wet meadow (7783); Steen I., riverbank (7725). Obs.: several other stations.

Veronica serpyllifolia L. Common; pastures, lawns, moist waste land; adventive. Coll.: Wales, dry slope (8387). Obs.: many stations.

Veronica officinalis L. Scarce; dry woods; native. Coll.: Wales, gravel hillside (7807). Obs.: no other station.

Veronica scutellata L. Scarce; streambanks; native. Coll.: 3 miles W of Cornwall, open marsh (7680). Obs.: no other station.

Veronica (?beccabunga L.) Frequent; seepage banks, generally sterile; adventive. Coll.: above Cornwall, springy shore of River (15606); Sheek I., shoreline, flowering (2407); Mille Roches, by stream (8095); Wales, choking Hoople Creek (8199).

Gerardia paupercula (Gray) Britt. var. paupercula Rare; shore of St. Lawrence; native. Coll.: Cornwall I., rivershore (8001).

Gerardia paupercula var. borealis (Pennell) Deam Scarce; rivershores and moist sandy fields; native. Coll.: Sheek I., springy shore-meadow (15498); Aultsville Station, sandy old field (7868A); Presqu'ile, beach (8139A).

Gerardiatenuifolia Vahl var. parviflora Nutt. Frequent; river shores and moist sandy land; native. Coll.: above Cornwall, springy shore of River (15610); Sheek I., sandy gravelly shore (8057); Aultsville Station, sandy old field (7868B); Morrisburg, shore marsh (15300X); Iroquois, upper beach of River (14815); Presqu'ile, swamp (8128), sand beach (3139B); Tuttle Point, waste land by canal (14855).

#### OROBANCHACEAE

Epifagus virginiana (L.) Bart. Scarce; beech woods; native. Coll.: 3 miles W of Cornwall, on roots of beech (7962).



## PHRYMACEAE

Phryma leptostachya L. Frequent; rich woods; native. Coll.: Wales, abundant in low woods (7756); Farran Point, abundant in sandy maple woods (15664); Steen I., woods, corolla almost white (14552).

## PLANTAGINACEAE

Plantago major L. Very common; lawns, pastures, roadsides, upper beach of River; adventive. Coll.: Mille Roches (8101); Sheek I. (2359); Steen I., common on sand beach (15597); Morrisburg, fasciated (15475).

Plantago rugelii Dcne. Scarce; possibly native. Obs.: with P. major and P. lanceolata along grassy path by Long Sault rapids (no collections).

Plantago lanceolata L. Frequent; grassy areas and waste land, along canals; adventive. Coll.: Sheek I., common in grassy area (2335); Aultsville Station, pasture (14615); Iroquois, meadow by locks (14845). Obs.: Long Sault, along grassy path.

## RUBIACEAE

Galium triflorum Michx. Frequent; deep woods; native. Coll.: 3 miles W of Cornwall, moist sandy woods (7671A); Sheek I., maple bush (2385); Wales, low ash woods (7774); Steen I., moist woodland (14557).

Galium palustre L. Common; marshy river shores, swampy meadows, ditches; native. Coll.: Sheek I., marshy shore (7927), shoreline (2409); Long Sault, moist meadow on shore (15140); Steen I., wet clearing in woods (14565); Iroquois, shore of River (14814).

Mitchella repens L. Rare; deep woods; native. Coll.: 3 miles W of Cornwall, abundant in woods (7670, 7967).

## CAPRIFOLIACEAE

Diervilla lonicera Mill. Scarce; sandy open areas; native. Obs.: Sheek I., grassy area (no collection).

Lonicera dioica L. Scarce; thickets or thin woods on islands in the River; native. Coll.: Steen I. (15643); Indian I. (15704).

Lonicera tatarica L. Scarce; thickets; adventive. Obs.: 2 miles E of Iroquois, shoreline thicket (no collections).

Symphoricarpos occidentalis Hook. Rare; waste land; adventive. Coll.: Farran Point, isolated patch on railroad embankment (15668). Obs.: no stands of native origin present.

Viburnum alnifolium Marsh. Scarce; rich woods; native. Coll.: 3 miles W of Cornwall, beech woods (7965); Wales, deep shade (8458). Obs.: no other sites.

Viburnum lentago L. Common; banks of River and thickets; native. Coll.: Wales, roadside (7657); Steen I., dry riverbank (7717, 15649); Indian I., abundant on shore-bank (15708). Obs.: 3 miles W of Cornwall, sandy woods; Sheek I.; Long Sault, woods; Farran Point, willow swamp; Aultsville Station, wet land.

Viburnum acerifolium L. Scarce; dry woods; native. Coll.: Robinson's Creek, beech woods (7968); Mille Roches, second-growth woodland (15156); Sheek I., wooded slope to rapids (7621, 14408). Obs.: localized in general vicinity of Long Sault rapids; not seen elsewhere.

Sambucus canadensis L. Frequent; creek banks and marshy thickets; native. Coll.: 3 miles W of Cornwall, margin of Robinson's Creek (7983); Indian I., border of wet woods (15693). Obs.: Mille Roches, railroad ditch; Farran Point, railroad ditch; Iroquois, mucky woods; Prescott, rivershore.

Sambucus pubens Michx. Frequent; woods and thickets, dry banks; native. Coll.: 3 miles W of Cornwall, woods (8350); Sheek I., open bank of River (8400); Farran Point, low woods (7841); Steen I., open woods (14549). Obs.: Long Sault, thin woods; Indian I., wet woods.

#### CUCURBITACEAE

Echinocystis lobata (Michx.) T. & G. Common; shoreline thickets and wet waste land; native. Coll.: Wales, bank of Hoople Creek (8192); Iroquois, bank of River (14790). Obs.: Morrisburg, wet thicket; Iroquois Station, patch by railroad.

## CAMPANULACEAE

Campanula rapunculoides L. Scarce; roadsides; introduced, escaped from cultivation. Coll.: Wales, roadside patch 50 feet long, by schoolhouse (7655).

Campanula rotundifolia L. Rare; dry riverbank; native. Coll.: above Cornwall, dry steep bank of River in stand of Andropogon (15519). Obs.: no other records.

Campanula uliginosa Rydb. Frequent; shoreline marshes, swamps; native. Coll.: Sheek I., marshy shore (7929, 7938); Aultsville Station, shaded swamp (14606).

Lobelia siphilitica L. Rare; bank of St. Lawrence; native. Coll.: Sheek I., margin of spring in clay bank, abundant but restricted to habitat (7949). Obs.: no other sites.

Lobelia inflata L. Frequent; dry, generally disturbed soil; native, spreading as a weed. Coll.: Sheek I., roadside (2360), pastured woods (8060); Wales, gravel pit (7797, 7804).

Lobelia kalmii L. Scarce; moist shores of the River only; native. Coll.: above Cornwall, wet sod edging shore (15508); Sheek I., springy shore-meadow below dam (7913, 15497), sand-gravelly shore (8073); Steen I., shoreline (15656); Iroquois, upper gravelly beachline (15380); Presqu'ile, muck (8125).

## COMPOSITAE

Eupatorium maculatum L. Common; marshy land, often in dense stands; native. Coll.: Sheek I., shore-meadow (2408, 15499); Morrisburg, ditch (7832). Obs.: Farran Point, willow swamp; Aultsville Station, wet land; Iroquois, marshy shore, muck-woods.

Eupatorium perfoliatum L. Common; stream banks and marshy land; native. Coll.: Sheek I., marshy shore (7933); Wagners I., river shore (8035); Farran Point, wet pasture (7846); Morrisburg, wet land along shore (s.n.); Presqu'ile, beach (8136). Obs.: many stations.



Eupatorium rugosum Houtt. Frequent; wet woods; native. Coll.: Wales, elm-ash woods (8229); Farran Point, abundant in sandy maple woods (15665). Obs.: Sheek I.; Iroquois, mucky woods.

Solidago caesia L. Scarce; dry woods; native. Coll.: Steen I., old maple grove (15631).

Solidago flexicaulis L. Scarce; woods; native. Coll.: Long Sault, deep moist woods along shore (15486); Steen I., old maple grove (15632). Obs.: morainic woods near Moulinette, but at no other stations.

Solidago juncea Ait. Probably common; shores; native. Coll.: Sheek I., rocky shore (2424).

Solidago nemoralis Ait. Common; abundant in impoverished or dry land, fields, pastures, high riverbanks; native. Coll.: Sheek I., field (8053), dry shore (8177); Long Sault, dry slope to River (15480); Farran Point, sandy pasture (7844); Steen I., dry riverbank (15650).

Solidago rugosa Mill. Scarce; moist land, abundant in some old fields; native. Coll.: Sheek I., field border (8051).

Solidago canadensis L. Common; moist meadows and pastures, along shores; native. Coll.: Sheek I., river shore (7915, 8172); Steen I., clearing (14561). Obs.: Cornwall I., low pasture.

Solidago altissima L.

Occasional; old fields and dry banks; native. Coll.: Morrisburg, field margin (s. n.).

Solidago graminifolia (L.) Salisb. Common; along shores, moist fields, roadsides; native. Coll.: Mille Roches, moist land (s. n.); Sheek I., rivershore (2412, 7916). Obs.: Farran Point, low woods; Aultsville Station, moist sandy field; Iroquois, canal bank.

Aster macrophyllus L. Occasional; woodland; native. Coll.: Robinson's Creek, beech woods (7964); Sheek I., open riverbank (2383); Steen I., thin maple woods (15647). Obs.: Indian I., woods.

Aster cordifolius L. Common; dry clearings and banks; native.  
Coll.: Sheek I., dry river shore (8248); Wagners I., shore (8040);  
Steen I., high riverbank (15637); Indian I., dry clearing (15705).

Aster novae-angliae L. Very common; abundant in fields; edges of woods, along stream banks and particularly on the canal embankments; native or possibly introduced, spreading rapidly to cleared land. Coll.: Robinson's Creek (7952); Sheek I. (8052, 8160); Wales (8212, 8225); Farran Point (7837); Steen I. (7941); Iroquois (14937). Obs.: at numerous places; becoming less abundant in land a few miles back from the River.

Aster novae-angliae forma geneseensis House Rare; among the purple-flowered plants; segregating locally from the native or introduced population. Coll.: Steen I., a single plant in old field (15653). This white-flowered form was originally described from Genesee County, near Rochester, N. Y.

Aster puniceus L. Occasional; wet places; native. Coll.: Presqu'ile, swamp (8157). The apparent intergrades with A. novi-belgii are included under that species.

Aster novi-belgii L. Common; along streams, canal banks and ditches; native. Coll.: Mille Roches, streambank (8181); Iroquois, ditch (14941), canal edge (15424).

Aster lateriflorus (L.) Britt. Common; moist fields and clearings, edges of swamps; native. Coll.: Sheek I., shore (8247); Wales, bank of Hoople Creek (8219); Steen I., moist clearing (14555); Iroquois, abundant along shore (14801); Presqu'ile, swamp (8156).

Aster ontarionis Wieg. Occasional; creek banks and moist clearings; native. Coll.: Sheek I., border of low woods (8050); Wales, shaded clay bank of Hoople Creek (8198).

Aster simplex Willd. The small-flowered white asters are very common and occur in a variety of moist habitats; a series of entities is probably involved; native. Coll.: above Cornwall, common on moist river shore (15615); Mille Roches, meadow along stream (8096); Sheek I., river shore (7926, 8164), border of low woods (8054), gully (7942); Wales, ditch (7753), bank of Hoople Creek (8193, 8207); Farran Point, moist

sandy pasture (7847); Iroquois, abundant in meadow bordering lagoon (15377); Iroquois Point, abundant along shore of River (14835); Cardinal, shore of River (14904).

Aster umbellatus Mill. Apparently scarce; wet land; native. Coll.: Aultsville Station, shaded swamp (14607). Obs.: Iroquois, mucky woods.

Erigeron philadelphicus L. Common; widespread weed, abundant in some meadows but scarce elsewhere, frequent on cut-banks of River; native, spreading to open habitats. Coll.: Sheek I., steep bank to rapids (15089), bush (2387); Steen I., sandy beach (15596).

Erigeron strigosus Muhl. Common; open soil; native, spreading as a weed. Coll.: Sheek I., grassy area (2342); Steen I., bank (8268).

Erigeron canadensis L. Very common; weed of open soil, abundant along dry beaches; native. Coll.: Mille Roches, churchyard (8087); Presqu'ile, beach (8144).

Antennaria fallax Greene Scarce; sandy land; native. Coll.: 3 miles W of Cornwall, large colonies in sandy clearing (15150), creek bank under pines (8352). Obs.: at no other sites.

Antennaria neodioica Greene Small-leaved species (this and/or the next) are common; sandy land; native. Coll.: Mille Roches, rough clearing (15169).

Antennaria petaloidea Fern. Coll.: Wales, pasture (8388).

Anaphalis margaritacea (L.) Clarke Frequent; dry woods, clearings and fields; native. Coll.: Steen I., in woods (8059). Obs.: Aultsville Station, sandy woods.

Gnaphalium uliginosum L. Common; along upper beach-lines, weed in bare places in pastures; native, spreading to open habitats. Coll.: Steen I., cut-bank of River (14620). Obs.: Iroquois, trampled shore.

Gnaphalium obtusifolium L. Scarce; upper shoreline of River; native. Coll.: Steen I., riverbank (s.n.).



Inula helenium L. Frequent; conspicuous in some low pastures; adventive. Coll.: Sheek I., grassy area (2353); Wales, pasture (7772); Morrisburg, moist pasture (15369).

Ambrosia trifida L. Scarce; waste places; adventive. Coll.: Aultsville, garden edge (14570). Obs.: Iroquois, one plant at railroad station.

Ambrosia artemisiifolia L. Very common; roadsides and waste places; native, spreading as a weed. Coll.: Mille Roches, abundant in churchyard (8086).

Xanthium strumarium L. Common; upper beach-lines, stream banks, edges of marshes; native. Coll.: The specimens show some variation and different entities may be involved; Cornwall I., wooded shoreline (7996); Steen I., upper beach (8250); Aultsville Station, depression in pasture (14594); Morrisburg, lagoon edge (8277); Iroquois, beachline (14795X); Cardinal, pastured shoreline (8117).

Heliopsis helianthoides (L.) Sweet Rare; rich clearings; native. Coll.: Cornwall I., low wooded pasture (7987).

Rudbeckia triloba L. Scarce; stream banks; native. Coll.: Wales, clay bank of Hoople Creek (8220).

Helianthus annuus L. forma lenticularis (Dougl.) B. Boivin Scarce; railroads; adventive. Coll.: Farran Point, 10 plants along 1 mile of railroad (15661).

Helianthus tuberosus L. Scarce; forming large patches at a few scattered localities near River; native, possibly introduced by the aborigines. Coll.: Sheek I., roadside (8176); Long Sault, canal embankment (15495); Iroquois, waste land by River (14944).

Helianthus grosseserratus Martens Scarce; waste fields; adventive, possibly escaped from cultivation. Coll.: above Cornwall, old field by canal (15618).

Bidens cernua L. Common; abundant along creek banks, trampled muddy depressions, wet shore-lines and sand beaches (where dwarf) of River; native. Coll.: Mille Roches, streambank (8099); Wales, clay

creek bank (8194); Steen I., clay beach (8248), sandy beach (15592); Morrisburg, lagoon-edge (8280); Iroquois, beach-line (14799); lining rivershore (14808); Iroquois Point, common on shoreline (14837); Cardinal, pastured shoreline (8112), upper beach (14930); Presqu'ile, mucky swamp (8133).

Bidens connata Muhl. Probably common; wet places; native. Coll.: Robinson's Creek, swampy woods (7972); Mille Roches, streambank (8099B).

Bidens frondosa L. Frequent; creek banks; native. Coll.: Wales, clay bank of Hoople Creek (8200).

Bidens frondosa forma anomala (Porter) Fern. This form with antorse awns is abundant along shores of St. Lawrence where apparently confined, not being collected "inland"; plants are small, less than 1 foot high, on dry beaches but 4 to 5 feet in adjoining herbaceous thickets; native. Coll.: Sheek I., river shore (8078); Steen I., shoreline (8258); Aultsville, herbaceous thicket on shore (15578); Morrisburg, lagoon edge (8279); Iroquois, beachline (14793); Cardinal, shoreline (8106, 8124); Prescott, sandy shore (14882).

Bidens frondosa, a monstrosity with foliaceous pappus and pale-colored stems and heads (apparently diseased). Frequent in 1953; shorelines with normal B. frondosa f. anomala; native. Coll.: Iroquois, beachline (14800).

Megalodonta beckii (Torr.) Greene Scarce; large submerged masses in bays or inlets of St. Lawrence, non-flowering; native. Coll.: Aultsville, quiet lagoon (15565); Tuttle Point, lagoon (14856).

Galinsoga ciliata (Raf.) Blake Still rather scarce; weed of garden and waste places; adventive. Coll.: Morrisburg, roadside dump (Montgomery 1121); Iroquois, garden (15318).

Helenium autumnale L. Rare; introduced. Coll.: Steen I., old garden site on shore, a single clump 5 feet tall (15657). Obs.: no native plants such as line the shores of Ottawa River seen.

Achillea millefolium L. Common; widespread weed of fields, pastures, roadsides; adventive. Coll.: Mille Roches, roadside (15175), forma

rosea Rand & Redfield (15174); Sheek I. , grassy area (2332); Steen I. , shore (s. n. ).

Anthemis cotula L. Frequent; weed especially in trodden places; adventive. Coll. : Morrisburg, bare patch in pasture (15302).

Matricaria matricarioides (Less.) Porter Common; abundant weed of road-edges, door-yards and waste places, also on beach of River; adventive. Coll. : Morrisburg, beach (15293). Obs. : at many weedy sites.

Chrysanthemum leucanthemum L. var. pinnatifidum Lecoq. & Lamotte Very common; old hay fields, roadsides and waste places, a widespread weed; adventive. Coll. : Mille Roches, railroad embankment (15170); Sheek I. , grassy area (2351).

Chrysanthemum parthenium (L.) Bernh. Cultivated ornamental; introduced, spreading. Coll. : Aultsville, garden (8276).

Chrysanthemum sp. , a tall garden perennial escaped from gardens nearby and growing from crevices of lock-walls at Morrisburg (15474).

Tanacetum vulgare L. Very common; abundant and forming dense coarse stands along roadsides, field margins, and on high banks of River and canal; almost everywhere but not extending "inland" over a mile or two; adventive. Coll. : Sheek I. , abundant weed (7290, figure 38); Morrisburg, field margin (s. n. ).

Artemisia biennis Willd. Common; often abundant as small plants along upper shorelines of River, appearing in late season; reputedly adventive, but appears as if native. Coll. : Iroquois, beach (14811); Cardinal, shoreline in pasture (8114); Prescott, sandy beach (14888).

Artemisia vulgaris L. Scarce; waste places; adventive. Obs. : Mille Roches, a few patches along railroad (no collections).

Senecio vulgaris L. Common; weed of gardens and waste places; adventive. Coll. : Iroquois, railroad (15314). Obs. : several listings.

Senecio viscosus L. Scarce; weed of waste places; adventive. Coll. : Tuttle Point, fill along canal (14847). Obs. : Morrisburg, waste ground by canal; no other listings.



Arctium minus (Hill) Bernh. Common; coarse weed of idle ground; adventive. Coll.: Aultsville, old field (15572). Obs.: several stations.

Cirsium discolor (Muhl.) Spreng. Rare; moist borders of woods; native. Coll.: Robinson's Creek, creek margin (7953).

Cirsium arvense (L.) Scop. Very common; abundant weed of old fields, pastures, roadsides and waste places, usually forming large clones; adventive. Coll.: Sheek I., grassy area (2348); Iroquois, field, white-flowered form (15379).

Cirsium vulgare (Savi) Tenore Frequent; weed in old pastures and waste land; adventive. Obs.: Morrisburg, pasture; Iroquois, canal bank; Toussaint I., pasture (no collections).

Cichorium intybus L. Scarce; weed of fields and roadsides; adventive. Coll.: Sheek I., roadside (2356). Obs.: Morrisburg, waste ground by canal, railroad; Iroquois, abundant by railroad.

Tragopogon pratensis L. Frequent; roadsides and waste places; adventive. Obs.: Morrisburg, common; Iroquois, railroad (no collections).

Taraxacum officinale Weber Very common; fields, roadsides, etc.; adventive. Coll.: Sheek I., edge of woods (8438).

Sonchus arvensis L. Common; weed of fields and waste places; adventive. Coll.: Morrisburg, dry ditch (15375X). Obs.: Toussaint I.; Prescott, beach.

Sonchus asper (L.) Hill Common; weed of roadsides, gardens and waste bare places; adventive. Coll.: Sheek I., rocky shore (2428); Aultsville, garden (15620).

Sonchus oleraceus L. Scarce; weed; adventive. Obs.: Cornwall, yard (no collections).

Lactuca canadensis L. Frequent; clearings; native. Coll.: Sheek I. (2369); Wagners I., pasture (8028); Steen I., opening in woods, common (15639). Obs.: Iroquois Point; Prescott, beach.

Lactuca scariola L. Common; weed in waste places; adventive.  
Coll.: Mille Roches, field (8090); Steen I., eroded bank (8273).  
Obs.: Morrisburg, waste place by canal; Iroquois, shore; Iroquois Point; Prescott, beach.

Lactuca biennis (Moench) Fern. Scarce; moist clearings; native.  
Coll.: Robinson's Creek, creek margin (7957).

Prenanthes alba L. Scarce; moist open woods and clearings; native.  
Coll.: Cornwall I., low wooded pasture (7992).

Prenanthes altissima L. Common; woods; native. Coll.: Wales, woods (8222); Steen I., abundant in maple woods (15648). Obs.: 3 miles W of Cornwall, woods.

Hieracium aurantiacum L. Frequent; a weed, quite widespread but not yet abundant in area ; adventive. Coll.: Mille Roches, sandy pasture (15164); Sheek I., opening in woods (2394). Obs.: a solid block on a cemetery plot at Moulinette.

Hieracium florentinum All. Common; abundant weed; adventive.  
Coll.: Sheek I., grassy area (2377); Morrisburg, field (15367).  
Obs.: several records.

Hieracium scabrum Michx. Scarce; woods and clearings; native.  
Coll.: Robinson's Creek, clearing (7963). Obs.: no other sites.

APPENDIX A

Native species subject to extinction

The following species, selected from the foregoing list, are plants of restricted distribution and localized in the area, mainly associated with the present shoreline. Flooding will likely completely eliminate them from the region. They are relatively few in number.

Equisetum fluviatile  
Equisetum laevigatum  
Selaginella apoda  
Agropyron trachycaulum  
Andropogon gerardii  
Cyperus engelmannii  
Dulichium arundinaceum  
Scirpus smithii  
Cladium mariscoides  
Carex scabrata  
Juncus torreyi  
Symplocarpus foetidus

Podophyllum peltatum  
Dentaria maxima  
Arabis divaricarpa  
Hamamelis virginiana  
Astragalus canadensis  
Apios americana  
Zizia aurea  
Angelica atropurpurea  
Heracleum lanatum  
Monarda fistulosa  
Penstemon hirsutus  
Campanula rotundifolia



## APPENDIX B

### Absenteeism of species in the Seaway Project area

Those species which might be expected to occur in the area on account of their presence in surrounding land but which were not encountered, are listed below. In this list absenteeism is accorded only those species which are (a) sufficiently conspicuous and distinctive to gain the attention of field surveyors, (b) adapted to the habitats that are available (plants of bogs, sand dunes, rock cliffs or limestone pavements, etc. are excluded), (c) native, or (d) introduced (\*) and of special interest. The list of native species is quite long, and many others might be added.

Equisetum scirpoides  
Lycopodium clavatum  
Lycopodium obscurum  
Isoetes spp.  
Botrychium spp.  
Taxus canadensis  
Abies balsamea (rare)  
Pinus resinosa  
Pinus rigida  
Pinus banksiana  
Juniperus communis  
Juniperus virginiana  
Potamogeton spirillus  
Potamogeton epihydrus  
Potamogeton amplifolius  
Bromus purgans  
Bromus kalmii  
Bromus tectorum \*  
Festuca obtusa  
Glyceria canadensis  
Glyceria melicaria  
Eragrostis hypnoides  
Eragrostis megastachya \*  
Phragmites communis  
Hordeum jubatum

Elymus canadensis  
Trisetum spicatum  
Deschampsia caespitosa  
Deschampsia flexuosa  
Sporobolus cryptolepis  
Cinna latifolia  
Muhlenbergia frondosa  
Muhlenbergia glomerata  
Oryzopsis pungens  
Oryzopsis racemosa  
Milium effusum  
Hierochloë odorata  
Leersia virginica  
Zizania aquatica var. aquatica  
Panicum latifolium  
Panicum virgatum  
Panicum xanthophysum  
Panicum oligosanthos  
Echinochloa walteri  
Andropogon scoparius  
Sorghastrum nutans  
Cyperus diandrus  
Cyperus inflexus  
Cyperus schweinitzii  
Cyperus filiculmis

Scirpus subterminalis  
Scirpus lineatus  
Carex stipita  
Carex flava  
Carex pseudo-cyperus  
Calla palustris  
Eriocaulon septangulare  
Pontederia cordata  
Juncus filiformis  
Juncus balticus  
Juncus canadensis  
Juncus pelocarpus  
Luzula multiflora  
Veratrum viride  
Lilium spp.  
Trillium cernuum  
Saururus cernuus  
Myrica gale  
Comptonia aspenifolia  
Celtis occidentalis  
Tovara virginiana  
Phytolacca americana  
Stellaria graminea \*  
Ranunculus repens \*  
Nymphaea odorata  
Menispermum canadense  
Adlumia fungosa  
Dicentra cucullaria  
Dicentra canadensis  
Corydalis sempervirens  
Draba spp.  
Alliaria officinalis  
Drosera rotundifolia  
Sedum acre  
Chrysosplenium americanum  
Parnassia parviflora  
Ribes lacustre  
Physocarpus opulifolius  
Sorbus americana  
Waldsteinia fragarioides  
Potentilla fruticosa

Potentilla palustris  
Potentilla simplex  
Geum rivale  
Prunus pumila  
Desmodium nudiflorum  
Lespedeza capitata  
Rhus vernix  
Nemopanthus mucronata  
Staphylea trifolia  
Acer spicatum  
Hypericum ellipticum  
Hypericum kalmianum  
Dirca palustris  
Decodon verticillatus  
Hippurus vulgaris  
Aralia racemosa  
Aralia hispida  
Monotropa uniflora  
Epigaea repens  
Nymphoides lacunosa  
Convolvulus spithameus  
Convolvulus arvensis \*  
Phlox divaricata  
Gratiola neglecta  
Lindernia dubia  
Melampyrum lineare  
Euphrasia spp.  
Pedicularis canadensis  
Utricularia spp.  
Galium aparine  
Cephalanthus occidentalis  
Lonicera canadensis  
Symphoricarpos albus  
Linnaea borealis  
Triosteum aurantiacum  
Viburnum cassinoides  
Viburnum rafinesquianum  
Viburnum trilobum  
Dipsacus sylvestris \*  
Sicyos angulatus  
Lobelia cardinalis

Solidago squarrosa

Aster ptarmicoides

Bidens discoidea

Helenium autumnale

Tussilago farfara \*

Erechtites hieracifolia

Senecio pauperculus

Centaurea spp. \*

Hieracium canadense

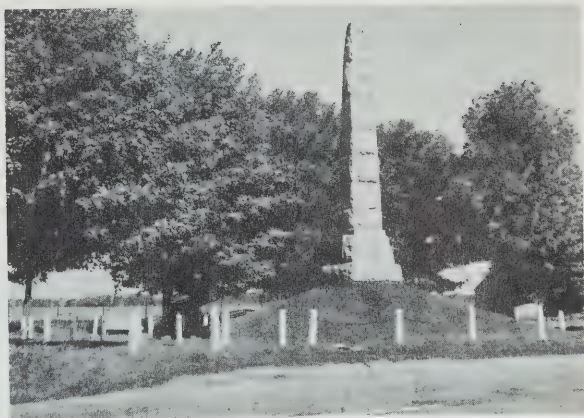
Hieracium pilosella \*



- Fig. 1      The present 14-foot canal completed in 1901 was constructed to by-pass the Long Sault rapids barely visible in the distance. Sumac (Rhus typhina) has occupied the canal banks, forming groves by underground propagation.
- Fig. 2      The Crysler Farm Monument commemorating the Canadian victory of November 11, 1812, will have to be re-located. The sugar maples around it have been planted.
- Fig. 3      A black walnut tree, the only one in the area, grows from the bank of an abandoned road near Cardinal. Its position testified to its adventive origin. In Canada, black walnuts occur naturally only west of Toronto.
- Fig. 4      A representative portion of the CNR line near Iroquois illustrates the extent to which man has altered the conditions for plants.
- Fig. 5      A typical dead-water inlet from the canal at Mille Roches showing lush growth of aquatic and marsh plants.
- Fig. 6      Lombardy poplars and black locusts now replace the native trees along the shore near Aultsville.



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- Fig. 7      Grassy Island is essentially a sand bar with a clump of trees at the upstream end.
- Fig. 8      Most of Grassy Island is covered by a dense reed-swamp of Scirpus, Typha and Sparganium. Phragmites, which might be expected to dominate such a habitat, is absent here and throughout the whole region.
- Fig. 9      Wagners Island, at one time grazed, now has a thick cover of weeds and high grass.
- Fig. 10     Part of Wagners Island is still wooded.
- Fig. 11     Indian Island, the only completely wooded island within Canadian waters, has an essentially native flora but lacks the sugar maple, beech, hemlock, and white pine characteristic of the regional forest type. Several adventive species (Phalaris, Butomus, Lythrum, Tanacetum Pastinaca) abundantly established on the mainland shores, have not reached the island.
- Fig. 12     Shrubs of Viburnum lentago and Sambucus canadensis fringe a small Calamagrostis swale in the center of Indian Island. The large trees are chiefly basswood, elm, red and white oak, and white ash.





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- Fig. 13      A shallow cove, south side of Toussaint Island, showing the nature of the strand at low-water with the igneous boulders from the glacial soil exposed on a thin layer of alluvium.
- Fig. 14      Continuous grazing has produced a sward of adventive species: Poa pratensis, Trifolium repens, Taraxacum, Plantago major, Festuca rubra. Ash and willow line the Toussaint Island shore.
- Fig. 15      May-apple (Podophyllum peltatum) is one of the few native herbs present in the parkland shown in Figure 16. A wild fruit with rich flavor, it is present only on the islands in the River.
- Fig. 16      The parkland at the upper end of Toussaint Island consists mainly of American elms but has basswoods, hickories, butternuts and oaks. Many of the elms exhibit a curious curve high in the trunk.
- Fig. 17      A large slippery elm (Ulmus rubra) in the parkland: of the three individuals noted in the area to be flooded, this one is by far the largest.
- Fig. 18      Good herbage, abundant water, adequate shade and isolation have made the island ideal ranges for cattle and horses. Grazing is close except under the trees where the grass is less palatable as shown in Figures 15, 16 and 17.





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- Fig. 19      A gravel moraine consisting of rounded boulders carried from the Shield by glacial ice occurs between Wales and Moulinette. Only the top of the moraine will remain exposed a few feet above the new lake.
- Fig. 20      Beech - maple - basswood woods on moraine above the gravel pit shown in Figure 19.
- Fig. 21      In the background, an American elm contrasts its form with that of the only rock elm seen in the area; the former is actually twice the height of the latter. Represented among the trees on the same moraine are the rare Acer nigrum, Carya cordiformis and Ulmus rubra.
- Fig. 22      Ground flora in wet elm - ash woods below the moraine: Laportea canadensis and ferns are associated with Phryma leptostachya, Hystrix patula and Sanguinaria canadensis.
- Fig. 23      Shagbark hickory is present only within a short distance of the River. It is said to bear fruit only in alternate years. Here a row of trees, heavily laden with nuts, line a slow stream through a pasture between Morrisburg and Iroquois.
- Fig. 24      The same hickory trees form a backdrop to the characteristic marsh and aquatic vegetation of the stream.



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- Fig. 25      Bouldery shore below Iroquois showing the herbaceous thicket of Impatiens, Bidens, Lythrum, Phalaris and Polygonum at the highwater line as marked by debris, and the shrub thicket of Rhus typhina, Vitis, Pyrus, Crataegus and Rubus on the slope above.
- Fig. 26      Aquatic plant remains (mainly Vallisneria) cast up by successive water levels on the sand beach near Johnstown. Crack willow (Salix fragilis) is the chief tree of the strand.
- Fig. 27      Gravelly bottom at the municipal beach at Iroquois with patches of the green alga, Cladophora, evident in the clear water.
- Fig. 28      A characteristic shoreline marsh where the current is moderate. Scirpus fluviatilis and Typha latifolia are in the foreground and Scirpus validus farther out.
- Fig. 29      Kenilworth ivy (Cymbalaria muralis), ordinarily not hardy in Eastern Canada, grows in profusion from masonry crevices in the shelter of the lock walls at Morrisburg.
- Fig. 30      Populus balsamifera characteristically forms unisexual clonal groves along the canal embankments, with the oldest trees in the center and the smaller ones on the periphery.





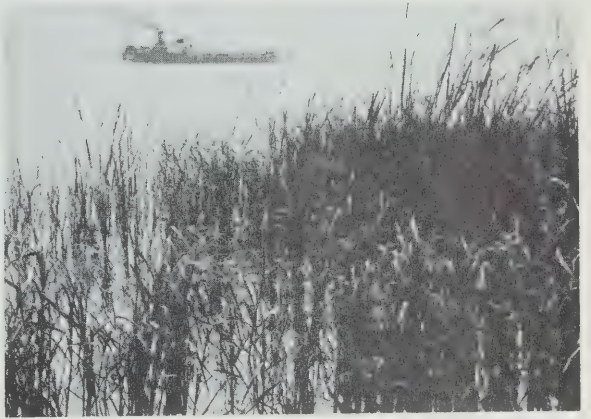
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- Fig. 31      The turbulent Long Sault Rapids which wash between the upper end of Sheek Island and Long Sault Island on the United States shore will soon be stilled.
- Fig. 32      Ault Park, a recreational area set aside at the head of Sheek Island overlooking the Long Sault, still has a fringe of original trees, oaks, pine, maple, elm, hickory and butternut. A memorial plaque is set in a large granite glacial boulder.
- Fig. 33      The quiet cove at the head of the channel between Sheek and Barnhart Islands was probably the landing place for the portage over the Long Sault. The shoreline meadow is the site of Equisetum variegatum and Eleocharis compressa.
- Fig. 34      Beech woods on the sandy crest above the cove shown in figure 33 shelter witch-hazel and hazel-nut bushes. A rank growth of herbs, some of rare occurrence, occupies the seepage slope below.
- Fig. 35      The white pine - red maple grove on poorly drained Rubicon sand near Robinson's Creek, west of Cornwall, has been thinned and cleared of brush but its varied ground flora indicates a near-natural condition.
- Fig. 36      Skunk-cabbage fills in a swampy spot in the woods at the source of Robinson's Creek.





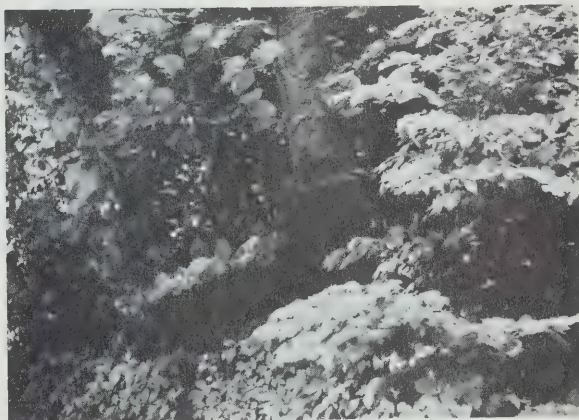
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- Fig. 37      Abandoned log cabin on the Steen Island Indian reservation showing raspberries advancing into a field from a former garden patch.
- Fig. 38      Tansy is a brilliant but rank weed, very abundant throughout the riverside area.
- Fig. 39      The old refinery in the sugar bush on Steen Island.
- Fig. 40      Sugar maples only were allowed to remain in the sugar bush. A dense growth of saplings has developed since the cessation of operations.
- Fig. 41      Preparing botanical specimens on the shore.
- Fig. 42      Bulrush (Scirpus validus) invading the sandy shore of Steen Island facing Aultsville. Low plants such as Eleocharis spp., Juncus spp., Carex cryptolepis, Ranunculus reptans and Potentilla anserina mat the wet beach while Lythrum salicaria, Phalaris anundinacea and Butomus umbellatus are rapidly encroaching.



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- Fig. 43      Cat-tail swamp fringing water-lilies and wild rice at the mouth of Hoople Creek near Dickinson Landing.
- Fig. 44      Alisma gramineum, characteristic of muddy shores, produces full panicles above the water here, but elsewhere it flowers completely submerged.
- Fig. 45      Flowering rush (Butomus umbellatus), an Old World ornamental, is now present at most places along the shore but its stands are not dense and do not extend far up tributaries.
- Fig. 46      A large spike-rush (Eleocharis smallii) juts out of water coated with duckweeds (Lemna and Spirodela) in the mouth of Hosaic Creek near Morrisburg. Beyond is an extensive Typha swamp.
- Fig. 47      Sagittaria rigida bears its flowers just above the surface but bends its stems to draw the maturing fruits below water.
- Fig. 48      Sagittaria latifolia exhibits much variation in leaf shape. This broad-bladed form is common and here grows with sweet-flag (Acorus calamus) in the marsh along the inlet shown in figure 24.





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- Fig. 49      Junction of dry channel (now dammed to form Bergen Lake) with channel between Sheek Island (at right) and Barnhart Island (in background) showing the only site where the River has cut down to bedrock. The limestone bed underlying the shoreline meadow has created a unique habitat.
- Fig. 50      The narrowness of the strand and its abrupt transition to the bank illustrates the relative constancy of level of the St. Lawrence, here shown at its low-water stage in mid-October.
- Fig. 51      The striking ability of crack willow (Salix fragilis) to produce adventitious roots is shown by this large trunk which has fallen into the water. It is easy to understand how all the trees along the shore could have originated from a single planting upstream.
- Fig. 52      Dense clones of reed canary-grass (Phalaris arundinacea) originating from seed, dominate the shores to the exclusion of native species. This grass probably represents an Old World strain, and as yet has not spread away from the River.
- Fig. 53      Wolffia columbiana, our smallest phanerogam, fills the surface waters in a thick granular coat in a marshy lagoon at the mouth of Hosaic (Nash) Creek. Surprisingly it was not found elsewhere, for the lagoon is continuous with the River at high-water time.
- Fig. 54      The present 14-foot locks can handle the smaller overseas freighters. The grounds around these Morrisburg locks and at other sites are beautifully developed and maintained as public parks.





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